ARMY ORDNANCE

VOL. XV, No. 89 MARCH-APRIL, 1935

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What About War Losses?
An Editorial

A BIMONTHLY REVIEW OF AMERICAN MUNITIONS
PUBLISHED BY THE ARMY ORDNANCE ASSOCIATION, WASHINGTON, D. C.

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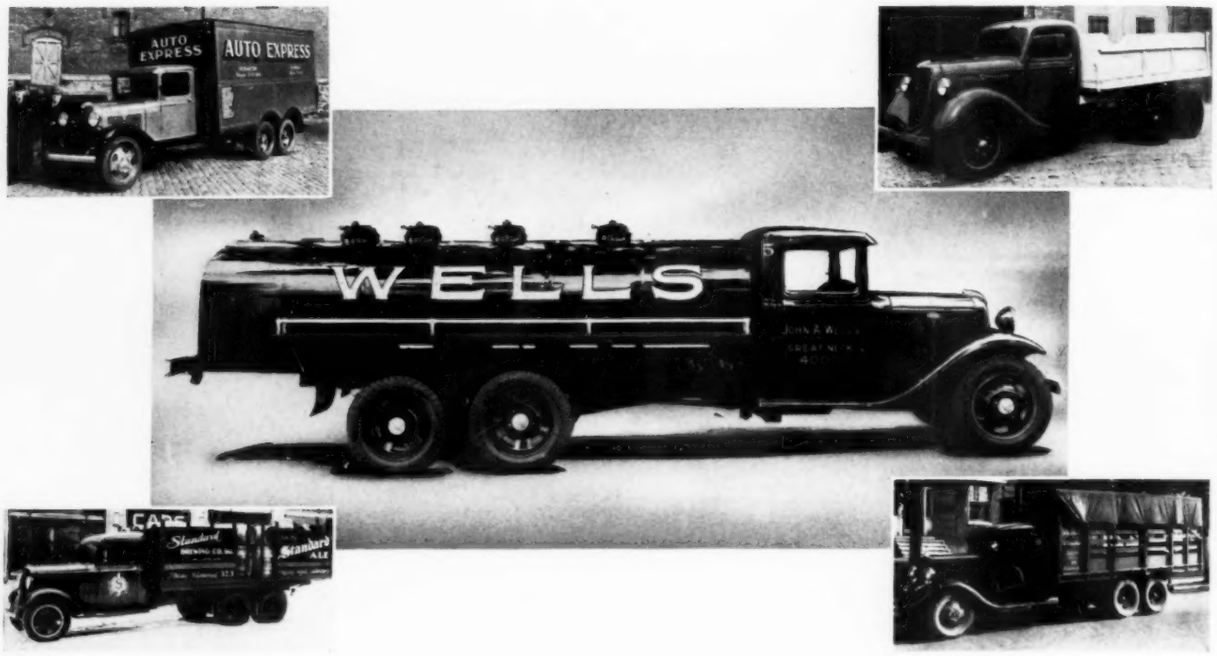

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ARMY ORDNANCE

The Journal of the Army Ordnance Association

Now in its Fifteenth Year of Publication

Pledged to Public Service in Effecting Industrial Preparedness for War as Our Strongest Guarantee of Peace

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"Since, however, it is apparent that here, as in every other state, foreign dangers necessarily attend domestic difficulties, I recommend that adequate and ample measures be adopted for maintaining the public defense on every side."—*President Abraham Lincoln, First Annual Message to Congress, December 3, 1861.*

The Army Ordnance Association

THE Army Ordnance Association is a national organization of American citizens pledged to industrial preparedness for war as our nation's strongest guarantee of peace.

The Association endeavors to keep alive an interest in and knowledge of the design, production and maintenance of munitions. Other than a few manufacturing arsenals—six in all—there is no peace-time industry for the production of ordnance. Should war unhappily come again, industrial America will be called upon to produce munitions in great quantity and of intricate and unusual design. In an emergency time will not permit careful study or long preparation for the production of munitions. The problem is one of vital concern.

THE Army Ordnance Association believes that the solution of this problem, based on experience, lies in an active organization at all times coöperating with the Government. The principal objective of the Association is an active membership of American citizens, on whom the duty of design and production of munitions will fall in war, who will have an accurate and authentic knowledge of the complex requirements of ordnance. "Peace insurance" in this form is the foremost aim of the Army Ordnance Association.

The Association is devoted solely to the national defense; it has no commercial interests, no political alliances, and no religious affiliations. It is not operated for profit: its income is expended in furthering its aims. Its officers and directors serve without remuneration.

ARMY ORDNANCE, the journal of the Association, is published solely for the purpose of disseminating information on the progress of our munitions developments so that American industry may at all times know its responsibilities to the common defense.

The objectives of the Association as set forth in its Constitution are:

To assist in effecting industrial preparedness for war as being one of the nation's strongest guarantees of peace;

To keep available the highly specialized knowledge necessary for arming the manhood of the nation by stimulating interest in the design and production of ordnance material;

To promote mutual understanding and to effect cooperation with American scientists, inventors, engineers and manufacturers in civil life and the regular and reserve officers of the Ordnance Department;

To provide, when required, the services of competent committees to investigate and report upon special ordnance subjects;

To assist in developing and maintaining an efficient personnel, both commissioned and enlisted, for the units required for Ordnance Field Service in the event of an emergency;

To commemorate the services rendered by the industry of the nation and by the officers and civilian employees of the Ordnance Department in the wars in which the United States has been engaged.

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CHIEF, CHICAGO ORDNANCE DISTRICT

ARMY ORDNANCE

Vol. XV MARCH-APRIL, 1935 No. 89

American Munitions

Private Industry Must Produce the Tools of Defense

By Hon. George H. Dern*

I AM very happy to be present tonight to participate in the celebration of the birthday anniversary of the Philadelphia Ordnance District. This organization was born during the destructive World War, as a result of necessity in the solution of problems of munitions procurement. The wisdom of such an organization was amply demonstrated by its success, and its continuation must follow as a measure of national security.

I believe that there are no persons in America today who are as well informed on the problems of my Department with respect to industrial preparedness for war as are the members of your organization. It is always a pleasure to meet with those who have an intelligent understanding of national defense in a modern world,—who realize that our national security requires more than the patriotism, courage and enthusiasm of its citizens. These personal attributes are tremendously important, but by themselves they are of little value against a powerful enemy equipped with the latest and best in the death-dealing instruments of war. Of what avail would be the personal bravery of the medieval bowman against the skill of the modern machine gunner?

You gentlemen are aware—many of you from personal experience—of the extreme difficulty of improvising modern military equipment in the midst of a conflict. We were fortunate in the World War in having allies who held the enemy in check until we could organize and equip our armies. We have no reason to expect such rare good luck in a future struggle. The early weeks of a war are tremendously important. A nation that is ready to fight may overcome all resistance before its adversary has equipped its army. Napoleon said: "Quarter hours decide the destinies of nations."

In war a country may be lavish with the expenditure of funds, and at times even extravagant in the sacrifice of the lives of its soldiers, but it must not waste time. Careful planning in peace may save weeks in war; and by such saving of time it may likewise make a tremendous saving in blood and treasure. Time often spells the difference between victory and defeat. I therefore begin with the proposition that time is of supreme importance; and industrial preparedness to turn out military equipment is primarily for the purpose of saving time.

Modern military machines are complicated special devices. They have no commercial counterpart. Our nation is highly industrialized, but we have practically no munitions industry. In another major war we would find that our peace-time munitions plants and our Army arsenals combined would be able to produce only a fraction of our immediate requirements. We would be dependent in the future, as in the past, on the conversion to military use of facilities normally engaged in the manufacture of non-military items. No one knows better than you gentlemen that such a process takes time. If by intelligent peace-time planning we can materially shorten that period we shall have made a tremendous contribution to national defense. Your organization is helping enormously in such planning, and the achievements already made are very heartening.

INTERNATIONAL events of the past few years have been of tremendous interest to members of the military profession and to others interested in our national security. On the one hand we have had earnest advocates of perpetual peace passionately pleading that by precept and example we take the lead in disarmament and in promoting accord through agreements for the pacific settlement of international disputes. On the other hand we have observed most of the leading nations greatly increasing their military and naval armaments, and pursuing policies of extreme nationalism and economic isolation, which inevitably provoke discord.

With reference to disarmament our policy has been, and still is, that we will coöperate with other nations to the fullest extent consistent with our national security. Our Navy has been kept dangerously below treaty stipulations, and even with the completion of vessels now building or in contemplation our naval strength will still be below that permitted by existing disarmament treaties. We have certainly been putting our trust in luck rather than in an adequate Navy. It is lucky that we have been so lucky.

Our Army is so microscopic that it does not constitute even a minor factor in disarmament discussions. In numerical strength it ranks approximately seventeenth, about on a par with Turkey and Portugal. Its equipment is shamefully in need of modernization. In land defenses we are a disarmed nation if there ever was one. Even the ruthless Treaty of Versailles allowed defeated and disarmed Germany a larger standing Army than we maintain in the continental United States. Before the World War we were, if possible, still more thoroughly disarmed than we are now and yet we got into the war. The same statement is equally true with respect to every war in which we have ever been engaged. I trust, therefore, that I may be pardoned for raising my eyebrows when I am told that the way to keep out of war is to disarm.

Closely linked to the disarmament discussions is the

*Secretary of War. This is an address before the Philadelphia Post, Army Ordnance Association, at a meeting under the joint sponsorship of the Post and the Philadelphia Chamber of Commerce commemorating the seventeenth anniversary of the Philadelphia Ordnance District. The Bellevue-Stratford Hotel, March 26, 1935.

question of the manufacture and sale of munitions of war. Broadly speaking, munitions may be said to embrace all supplies necessary or useful in the conduct of war. In a more restricted sense, which is the one frequently employed, munitions may be regarded as weapons and ammunition, war vessels, military aircraft and combat vehicles. The international trade in such munitions has been the subject of official inquiry in our own and other countries. Manufacturers of such products in industrial countries have sought purchasers among the governments of countries less favorably provided with such resources. Alleged methods used by traders in munitions have been attacked.

THESE attacks on makers of munitions are not new. Five centuries before Christ, Aristophanes charged that the armament makers of Ancient Greece were blocking peace. It is possibly true that agents of certain munitions manufacturers have opposed disarmament conferences and have attempted to interfere with the success of such parleys. There seems to be more than a suspicion that the methods of high pressure salesmen in disposing of their wares have sometimes been questionable. In efforts to curtail international trade in arms drastic remedies have been proposed, ranging from licensing factories to the prohibition of such trade and the nationalization of armament manufacture.

Some of those who are aroused over international traffic in arms regard the activities of munitions makers as a potent, if not the principal, cause of war. They hold that these industrialists deliberately promote international conflicts, with all the loss and horror that comes with them, for the purpose of making profits. Feverish activity in dealings in arms is, in my opinion, a symptom rather than a cause of international friction. If I read history rightly wars are generally caused by national and racial jealousies and hatreds, by population pressure, by imperialistic ambitions, and by economic rivalries. Very often the terms of peace treaties contain the germs of future conflicts. We got into the World War because we insisted upon the doctrine of the freedom of the seas, instead of keeping away from the danger zone as Mr. Bryan wanted us to do. International rivalry and distrust are apt to lead to armament races, which are certainly not checked by the activities of arms peddlers.

Eleven years ago a League of Nations committee said that the objections raised against private arms manufacture included:

"First, that armament firms have been active in fomenting war scares and in persuading their own countries to adopt warlike policies and to increase their armaments.

"Second, that armament firms have attempted to bribe government officials at home and abroad.

"Third, that armament firms have disseminated false reports concerning the military and naval programs of various countries in order to stimulate armament expenditure.

"Fourth, that armament firms have sought to influence public opinion through the control of newspapers in their own and in foreign countries."

I believe that the armament firms to which the report makes reference were largely European.

The evils of unregulated munitions traffic are apparent. The remedy for the situation is not so clear. Some suggest that the manufacture of war munitions be made a government monopoly in each country, and that international trade in arms be prohibited by treaty. Some even go so far as to declare that with the munitions industry nationalized and arms exports stopped, wars would be impossible. This contention is obviously fallacious. The result of such a policy would be to give highly industrialized nations a tremendous advantage over countries which are predominantly agricultural. There are about ten countries in the world which by reason of the development of industrial and natural resources are able to produce munitions in sufficient quantities to sell to other countries.

This situation has been clearly recognized by the non-producing countries and they have insisted at international conferences on their right to buy arms abroad. They have gone farther and at the Conference on International Trade in Arms insisted that the producing countries *must* sell. Thus it would seem that the greed of munitions makers is not the only element involved in international trade in arms.

SO long as war remains a possibility nations must prepare for their defense, and to do this they must have armament. If they are barred from importing munitions they must manufacture their own munitions. This would result in a vast expansion of international trade in raw materials entering into the fabrication of implements of war. Shall we then also prohibit the exportation of these raw materials, which may or may not go into munitions?

Similarly, if private manufacture of arms were stopped governments would have to go into the business of manufacturing arms, and if they had to depend solely on their own plants it is entirely possible that some countries would expand rather than contract this industry in order to feel secure. In the United States the contrary would probably be true, judging by past experience. I have visited our Government arsenals, and when I asked how well they were prepared to turn out munitions in large quantities on short notice, the usual answer was: "We are not prepared at all. Our machines are antiquated and ought to be replaced by up to date equipment. Our shop is poorly arranged. In short our plant ought to be remodelled and overhauled, if not rebuilt. Why, we cannot even get the money to repair our roofs." Now, if Congress will not keep up these little plants, I have a life-size picture of it appropriating the billion dollars that would be necessary to construct, and the fifty million dollars annually that would be necessary simply to maintain in operating order an adequate nationalized munitions industry. If it could be demonstrated that American munitions manufacturers had ever been responsible for getting us into a war, we might be justified in such extravagance, but I have yet to see any evidence to that effect. We have sought, and I think we have found, the cheapest way to secure an ample supply of war materials promptly. And it conforms to a policy of peace.

International control of the manufacture and export of war munitions was suggested, and immediately a host of very practical difficulties arose. The difference between military and non-military materials became of the utmost importance. To some countries the import of steel ingots, manganese, rubber and nitrates was more important than a supply of machine guns. Explosives have a value in industry as well as in warfare.

Let us narrow our discussion to the policies of our own country. Before the beginning of the World War little attention was paid in the United States to the manufacture of munitions of war. Some shipbuilding firms constructed war

vessels for our government and occasionally, though rarely, such a vessel for a foreign government. Private industry for the manufacture of land armament was almost non-existent. A few government arsenals of very limited capacity were maintained, and there was some private manufacture of explosives for construction and mining purposes and of sporting arms and ammunition.

Some of the European countries had been preparing for war and encouraging the development of a private munitions industry. Germany had foreseen her requirements in munitions, and had developed manufacturing possibilities to an unprecedented magnitude. She had made extensive plans for expanding the industry, and had her storehouses stocked with a comprehensive war reserve. She had, however, visualized a short war, hence the requirements for her armies far outran her calculations. Furthermore she had underestimated the effect of the lack of raw materials caused by the allied blockade of her ports.

The industries of France and England, though extensive, proved unequal to the war demand. The French Army was well-equipped initially and had a considerable war reserve. Great Britain was unprepared for the struggle, and for many months lacked essential war supplies. She had a highly developed manufacturing industry, but it took time to convert it to the task of filling war requirements.

The allied governments turned to America not only for raw materials, but also for finished and semi-finished items. Our industry was ill-suited to the fabrication of implements of war. The necessary machinery and machine tools had to be installed, and the personnel had to be familiarized with the manufacturing technique. However, as the war progressed a munitions industry in the United States was developed. The orders for munitions placed here by the allied governments prior to our entry into the war developed these elements for American industry, and it is a fact that should always be borne in mind that this condition to some extent prepared us to wage war on our own account. One wonders what might have happened if it had not been for these fortuitous circumstances. Verily, we must have a special Providence looking after us.

Even under these circumstances we obtained much of our fighting equipment from our allies. True, we did develop a tremendous war industry and the fact that we had enormous quantities of war supplies of all kinds ready for use at the front, and millions of well-equipped soldiers prepared for service, was undoubtedly a great factor in bringing the war to a close in November, 1918. The point I wish to emphasize is that we were ready at the close of the war, rather than at the beginning. If we had been better prepared for the struggle the war would certainly have been shortened and, indeed, we might not have had to fight at all. No less an authority than Edward M. House in referring to the situation just prior to our entrance into the World War, declares: "I was sure, given a large Army and Navy, the United States would have become the arbiter of peace and probably without the loss of a single life."

IT is for the purpose of preserving peace, not to wage war, that I advocate that our nation be kept in a reasonable defensive posture. This, I would say, necessitates a Navy second to none and a small but highly efficient Army, including an air force comparable to that of any of the other leading nations. We should have for our Army the best and most modern military equipment. This we have not. The World War left us with large stocks of arms, ammunition, tanks and motor vehicles, as well as immense quantities of harness, clothing and other necessary items. Much of this assortment of war material was placed in war reserve. With the passage of years it has deteriorated and become more or less obsolete. We hope to secure the necessary funds to provide over a period of years modern equipment for our Army, but we cannot hope to maintain large reserves of equipment for the mass of the citizen soldiery required in a major war. For such supplies we must look to private industry.

Some of the supplies needed are of a commercial type, and the difficulty in securing such items should not be serious. However, the supply of our future armies with weapons, ammunition, military aircraft and combat vehicles presents a problem that it would be folly to minimize. Through the assistance of patriotic manufacturers, and organizations such as yours, the War Department is making plans for the conversion of peace-time facilities to the production of war materials should an emergency arise. We are trying in time of peace to acquaint industry with our war needs, and by intelligent planning to shorten the period between the commencement of hostilities and the quantity production of war supplies.

You gentlemen are familiar in a general way, and perhaps many of you in detail, with our plans for the mobilization of industry. These plans are practical. They have been worked out by persons of broad experience both in and out of the military service. In their preparation we have had the active coöperation and assistance of members of the War Industries Board, of many of our great manufacturers, of scientists and experts of the various government departments, of the faculties of the business departments of our great universities and of able officers of the Army and Navy. These plans need frequent revision. To be of value they must be up-to-date. They should finally cover every manufacturing plant in the country. They must keep abreast of the latest in manufacturing technique. Constant studies bring about frequent improvements. We realize that our plans are far from perfect but they do constitute a carefully thought-out procedure for bringing to bear the vast force of our great industrial machine at the earliest possible moment in a national emergency. I have great confidence in these plans—a confidence that I am sure is shared by everyone familiar with them.

THOUGH our country is highly industralized we lack a munitions industry of sufficient magnitude to make even a start toward meeting our needs. It is not the policy of our government to lend encouragement to the establishment and development of an extensive munitions industry. On the contrary we have very definite general and specific pronouncements which tend to discourage rather than promote international traffic in arms.

It is the policy of the American Government not to encourage the exportation of arms and munitions of war. Diplomatic and consular officers in countries which provide a market for American exports of these articles have been instructed that they should not promote American trade in arms nor endeavor to create trade opportunities for exporters of such articles.

It is also the policy of this Government to refrain from disposing of arms and implements of war in its possession to foreign governments or to persons who may be presumed

to be about to transfer them to foreign governments. There have been certain minor exceptions to this policy. Under authority of a special act of Congress sales of surplus arms and munitions may be made to Cuba. Under special circumstances such sales have occasionally been made to Central American governments in response to specific requests from such governments. However, our government is reluctant to comply with such requests and desires that they be discouraged.

Presidential proclamations prescribing limitations upon the export of arms and munitions are now in effect in respect to Cuba, Honduras, and Nicaragua. Such exports intended for these countries are subject to special export license for each shipment. Ordinarily such licenses are not issued unless the government of the importing state has signified its desire that the shipment be permitted. Similarly restrictions have been placed on the export of arms to China.

This government views with disapproval export of arms to certain areas of Africa and the Near East unless it is satisfied they are required for lawful purposes, which in general means that they are for the use of a government recognized by the United States. It likewise views with grave disapproval the export of arms to Germany, Austria and Hungary. These countries are bound by treaties not to permit the importation of arms, and such importation would be considered as a violation of treaty obligations to the United States. By authority of Congress the President on May 28, 1934, prohibited the sale of arms and implements of war to Bolivia or Paraguay or to any person acting in the interest of either. These two countries are now engaged in a sanguinary conflict.

In addition our government has taken the lead in proposing to the nations of the world a draft of an agreement for international regulation and inspection of the manufacture and distribution of all types of naval and military armament. This convention proposes that all manufacturers of arms and implements of war be licensed by the respective governments, and that each manufacturer notify his government of all orders received. Each government in turn would agree to advise an international disarmament commission of all such licenses and of orders received. No arms would be exported or imported by any firm except in pursuance of export or import licenses issued by the governments concerned, and each government would advise the disarmament commission of the issuance of such licenses, and of exports and imports of arms. Each government would undertake to prevent the export or import of arms, except in accordance with an export license issued by the exporting country and a consular visa of the importing country.

This disarmament commission, composed of representatives of the several signatories would examine the information received and make it public, and in addition would conduct regular and special investigations, through regional inspection committees, appointed to establish facts and report them to the disarmament commission. The commission would supply the signatory countries and the League of Nations with information and advice.

It is too soon to speculate on the fate of the American suggestion. However, it has been accepted by the nations party to the disarmament conference as a basis for consideration and discussion. The regulation of the manufacture and trade in arms and the establishment of the commission would provide a procedure for carrying out any reduction or limitation of armament that might be agreed upon at any subsequent time.

CLOSELY allied to peace-time efforts to regulate traffic in arms are the proposals for the elimination of war profits. In our own country extensive investigations have been made and concrete proposals to this end have been advanced. I am in hearty sympathy with the efforts that are being made to prevent profiteering in war. A movement of this kind cannot fail to gain the support of all fair-minded people, even though they may not believe that it will act as a deterrent of war. To permit anyone to make an excessive profit out of the exigencies of war is unfair to the soldiers in the front-line trenches and also to the citizens at home who, by their thrift, work and sympathy, are supporting the group actually engaged in combat.

Primarily the object in war is to gain a complete and quick victory. The welfare of the country demands that nothing be permitted to stand in the way of this paramount objective. In order to achieve this end the full productive efforts of the country will probably be required. In a modern war not only the armed forces but the whole nation, with all its resources, is engaged in the effort. The maintenance of the national morale demands that all elements of the population shall be treated with equal fairness and justice, and hence it seems highly important that profit be limited, if not eliminated, in war. Nevertheless, this worthy undertaking must not be allowed to assume any form that will hamper, cripple or destroy the more vital thing of producing the necessary war materials when they are needed. The preservation of the country must come first.

I feel there is much to be said for the proposal that if we are so unfortunate as to be engaged in a war in the future it should be a pay-as-you-go war, that it should be financed by current taxes rather than by saddling future generations with an overpowering burden of bonded indebtedness. At the same time I must insist that the safety of the republic comes first, that all resources necessary to save it, including credit resources, must be used. We must not jeopardize our safety by fixing in advance a hard and fast rule as to methods of financing. However, I do feel that in war the taxes must necessarily be increased to the point that will give the government as high an income as is reasonably possible and that the issues of bonds should be dictated only by imperative necessities. The cost of the war should be held to the lowest point consistent with a speedy victory. Proper advance planning and preparation are means to this end.

In war the stimulated requirements for raw materials, fabricated products and services tend to cause a rise in price levels. Without control prices would soar to exaggerated heights, hence there must be government control of prices. This is necessary not only to prevent unfair and excessive profits from being made by individuals or corporations, but also, in a larger sense, for the purpose of holding down the cost of war. Moreover, price fixing seems to be the only method of preventing many classes of our citizenry, including farmers and workingmen, from innocently becoming war profiteers.

In taking undue profits out of war the fixing of price levels is a major element, but it is not the only element. Price-fixing alone cannot accomplish the desired result. It must be supplemented by reasonable and effective procedure in letting contracts, and also by excess profits tax laws.

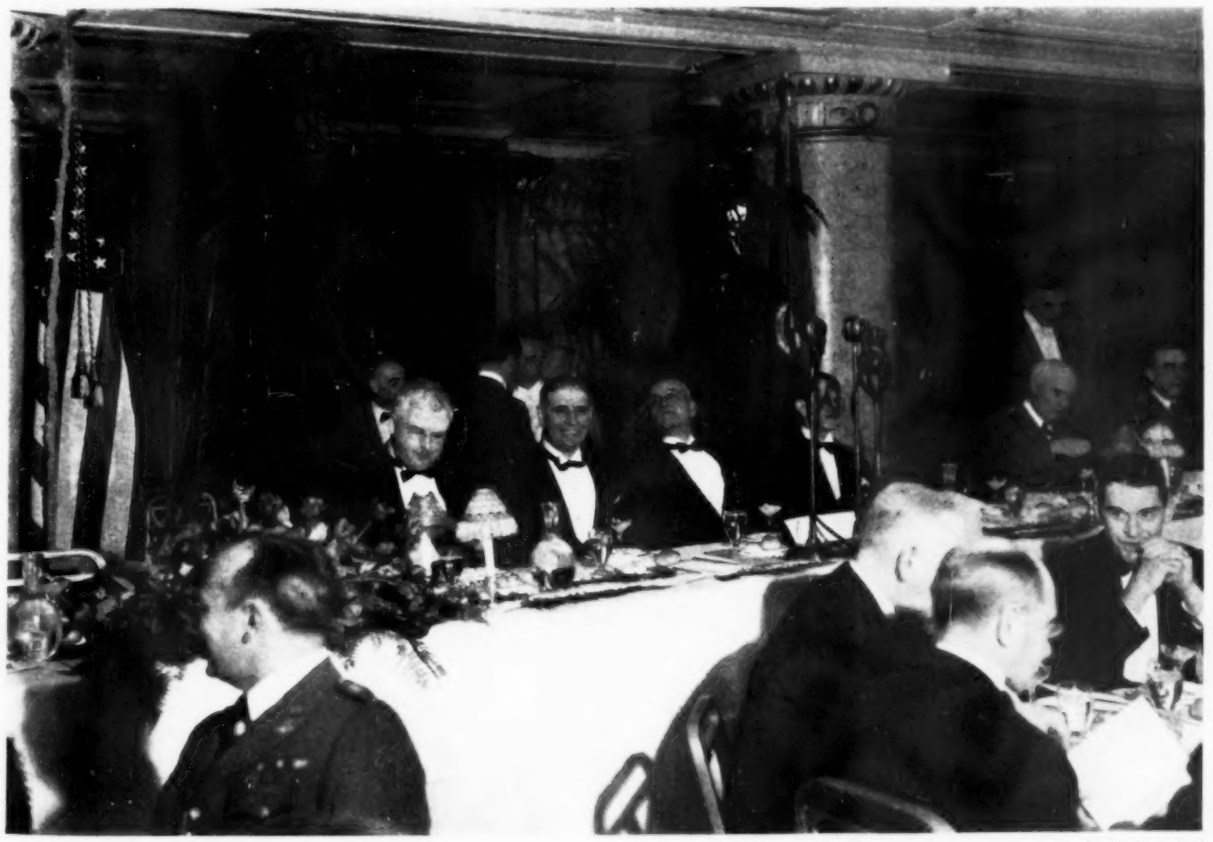
During a war, as you gentlemen well know, it is necessary to use the product of the high-cost producer as well as that of the low-cost producer. It therefore becomes necessary to set prices at a level which will make it possible for each producer to turn out his part of the nation's requirements without loss to himself. With such price level the low-cost producer is bound to make large profits. The only way to overcome this difficulty is to take the excess profits away from him through taxation.

AS I have said before on numerous occasions the experience of this nation as well as that of others forces me to the conclusion that in the event of war the major portion of our military supplies would have to be produced by private industry. It would be suicidal to depend on government-owned plants alone. The presence of you gentlemen indicates that you agree with me that private industry must be prepared to perform its war mission. It is therefore highly desirable that in time of peace industry should produce some war supplies, because any plant that has once produced such articles is thereafter better qualified to produce them more speedily in time of war. In brief our vital industrial problem in war is to produce the necessary war supplies and to do it first, so that our enemy can gain no advantage from our shortage. Time is the vital element. This fact cannot be repeated too often. This government will be placed at a serious initial disadvantage if it is forced to turn to an industry entirely unfamiliar with the production of munitions.

I want to stress my deepest interest in and sympathy with any fair, reasonable and effective movement which will minimize profit in war. The three essentials of war are men, munitions and money. Victory cannot be achieved without a plentiful supply of each of these essentials. I think we will not lack men or money. To the great private industry of the country we must look for our supply of munitions. Private industry must be sufficiently flexible to adapt itself to the production of war materials soon enough after the commencement of hostilities to make our defense effective.

In war the soldier has the spectacular role. He undergoes the hardships and the danger, but he also receives the glory. He who serves at Vulcan's forge plays a less conspicuous, but no less vital part. The thunderbolts that will check the aggressor will come from factories in the midst of peaceful communities; but to those who toil at lathe and trip hammer, and to those whose genius makes such production possible, the nation owes a lasting debt of gratitude.

Your organization is dedicated to the cause of reasonable military preparedness. You favor a lasting peace, but if fight we must you want a speedy victory. To such an end you are making a worthy contribution. I know of no other organization that practices more practical patriotism. May your zeal to serve your country never abate.

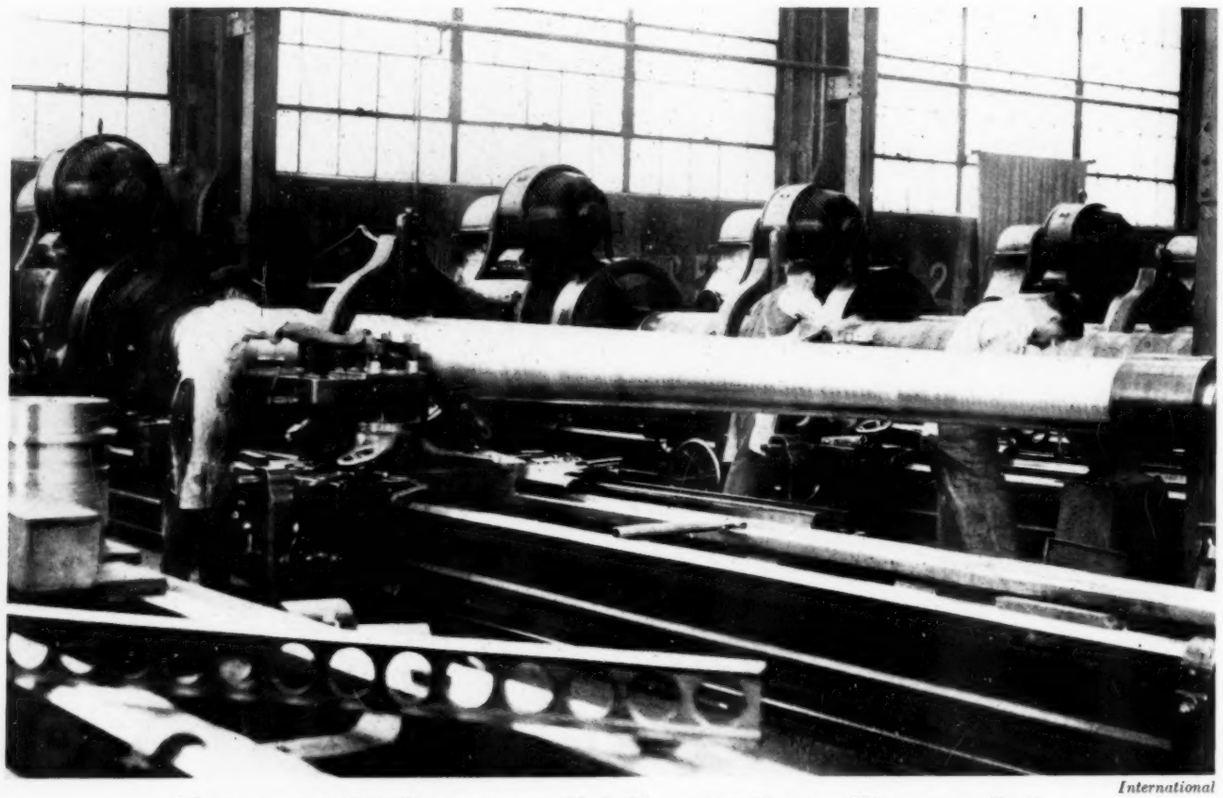


Hood-Weintraub

THE SECRETARY OF WAR AND GUESTS AT PHILADELPHIA ORDNANCE DISTRICT ANNIVERSARY, MARCH 26, 1935.

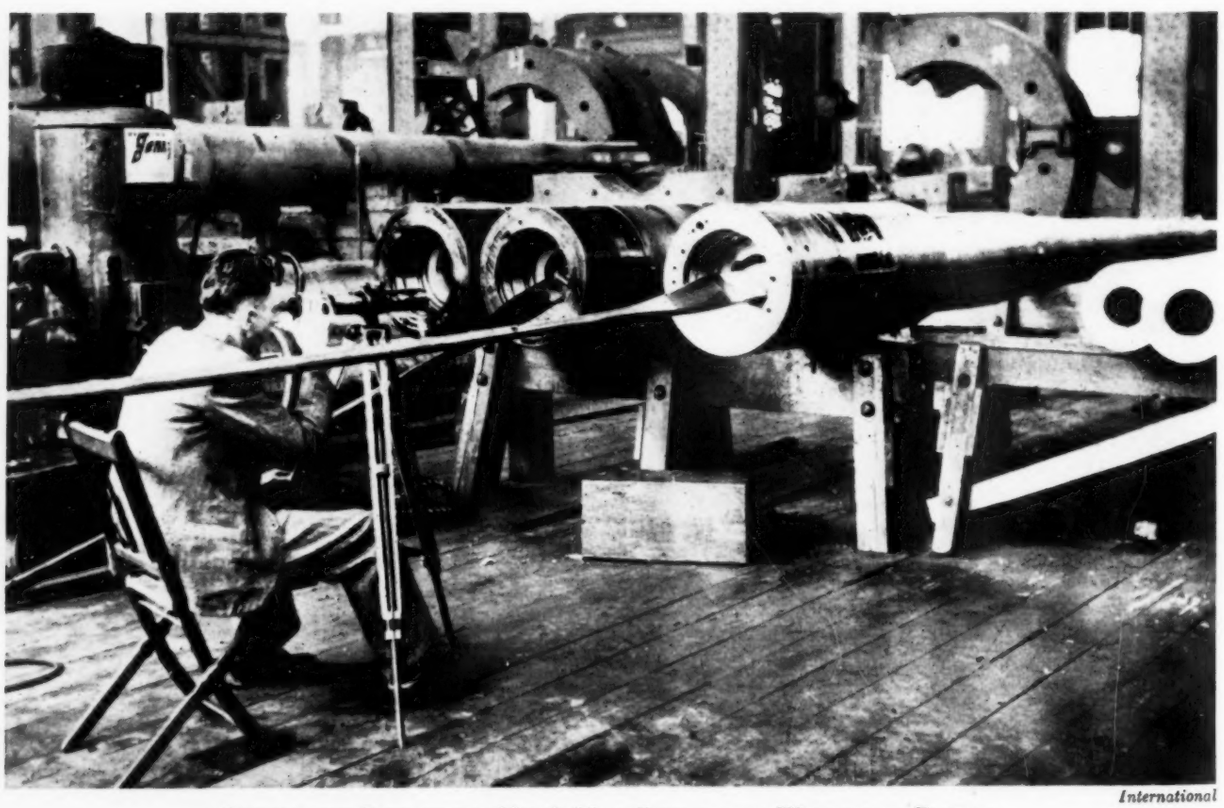
Scene at the Bellevue-Stratford Hotel Ballroom, Philadelphia, Pa., where the Secretary of War delivered the above address. Seated at speakers table (left to right): William F. James, President, Philadelphia Chamber of Commerce; Hon. George H. Dern, Secretary of War; Philip H. Gadsden, President, Philadelphia Post, Army Ordnance Association; Hon. J. Hampton Moore, Mayor, City of Philadelphia; Maj. Gen. William H. Tschappat, Chief of Ordnance, U. S. Army, and Brig. Gen. Herman W. Schull, Assistant to the Chief of Ordnance, U. S. Army.

Guns for the Treaty Navy



International

Machining the Gun Barrels at the U. S. Naval Gun Factory, Washington, D. C.



International

Gauging the Bore of the Navy's New Guns at the Washington Factory.

The Cause and Cure of War

Munitions and Their Makers Have Little To Do With Either

By Major General Johnson Hagood*

A NUMBER of so-called Peace Societies at the Rocky Mountain Regional Conference on the Cause and Cure of War conferred the unusual distinction of making me the principal speaker at a public gathering in the Broadway Theater in Denver, Colorado, February 8, 1935. It was the only gathering of this kind conducted during the conference. The organizations represented at the conference were as follows: American Association of University Women, General Federation of Women's Clubs, National Board of Young Women's Christian Associations, National Council of Federated Church Women, National Council of Jewish Women, National Federation of Business and Professional Women's Clubs, National League of Women Voters, National Women's Christian Temperance Union, National Women's Conference of American Ethical Union, National Women's Trade Union League, Colorado League of Nations Association, Altrusa Club of Denver, Women's International League for Peace, and the Zonta Club of Denver.

The plan for the meeting was that I should make the first and principal address of thirty minutes on the subject of Preparedness, and that following this, ten selected speakers should make replies of not to exceed three minutes each. At the end I was also to speak for three minutes additional. Dr. Ben M. Cherrington, Executive Secretary, Foundation for the Advancement of the Social Sciences, University of Denver, presided. He stated at the outset that among the many divergent views which would no doubt be presented, he hoped there could be at least some common point of departure upon which all hands could be agreed.

During the course of the discussion which followed my talk, Mrs. Frederick Beggs, National Chairman of Marathon Round Tables, suggested that a common ground might be found in the fact that there were two kinds of preparedness, both of which she favored. The first and most important was Preparedness Against War, and the second and least important from her standpoint was Preparedness for War.

Taking this as my cue, in my subsequent talk I emphasized the fact that Preparedness Against War lay in the field of statesmanship and diplomacy, while Preparedness for War was the function of the soldier; that while we could not emphasize too much the importance of the peace societies in the prevention of war, I as a soldier felt it to be my bounden duty to stand by ready to stop the war or to minimize its consequences when statesmanship and diplomacy had failed.

It goes without saying that no one agreed with everything that I said in my address. And some of those present agreed with very little. Yet the whole conference gave it their closest attention and in the end broke out with genuine and hearty applause.

Moreover, since returning to San Antonio, I have received a most cordial letter from Miss Fackt, Regional Chairman of the Conference, in which she stated in effect that if all the so-called militarists viewed this matter in the broad and practical light in which it had been presented by me, they thought a real step had been made towards substantial peace.

It will be seen from the above that what I actually said upon this occasion was of little or no moment. The big thing was that apparently a beginning has been made towards the reconciliation of the two great antagonistic forces which, each in its own way, are concerning themselves with national defense. The original address follows.

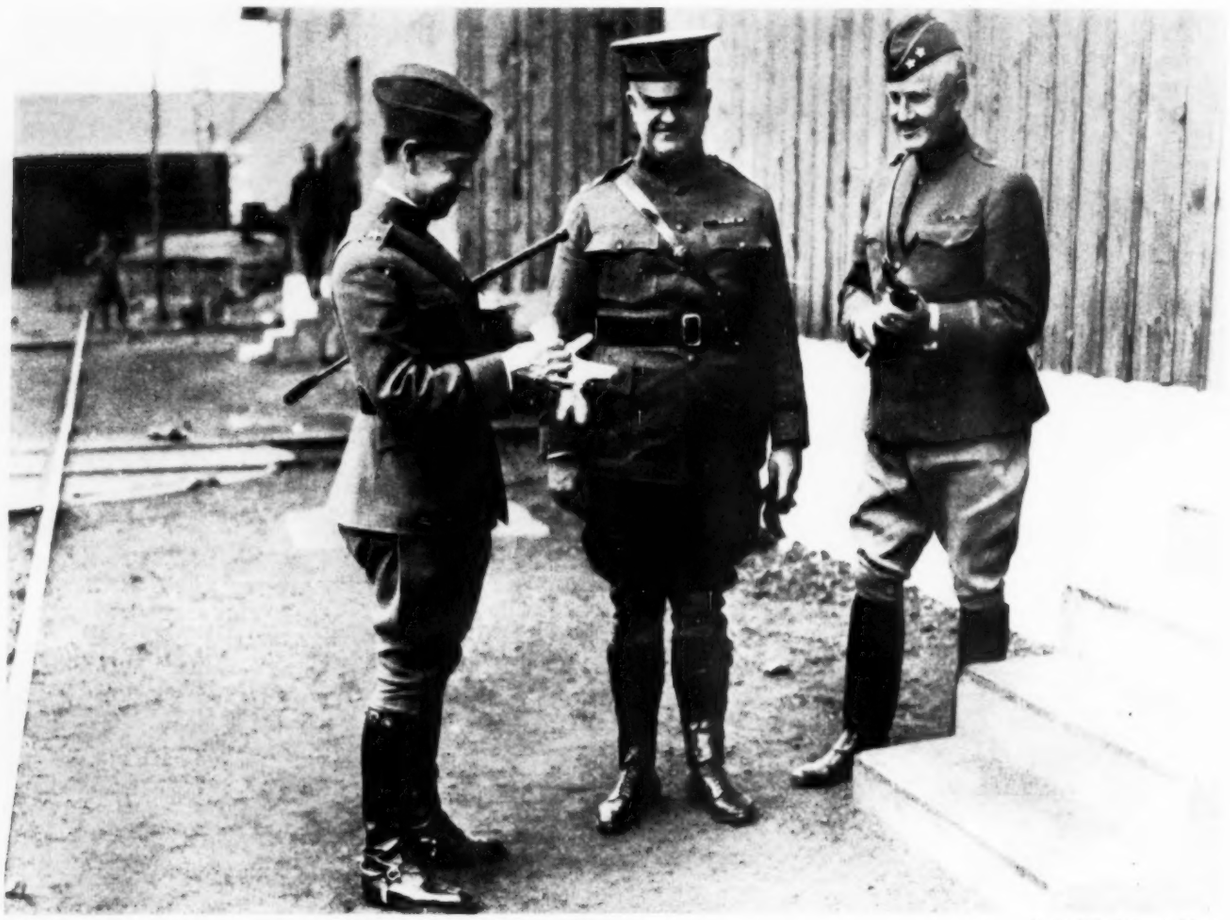
I AM not unaware of the unusual distinction that you have conferred upon me. Military men are not usually invited to address a gathering of this kind, and a glance at the list of your constituent and coöperating organizations is sufficient to convince anyone of the earnestness and of the seriousness of your work in the interest of World Peace. I have no doubt that in your ranks, just as in the ranks of the Army, there are some who are ignorant and stubborn, some who are bent upon proving their own theories and who are unwilling to listen to reason. But I know also that the most of you are seeking the truth, giving the best that is in you to bring to the world some form of relief from the most terrible affliction that has ever beset the human race.

You are right to seek the causes of war before you attempt to prescribe the cure. And for myself, though I do not believe that war can ever be wholly abolished, I am perfectly certain that it can be made less frequent, that in many cases it can be prevented, and that in all cases it can be made less terrible in some of its consequences. The causes of war are deep seated in the human heart. Successful conflict, physical as well as mental and moral, is the basis of all evolution and progress. I shall not concern myself with the causes of the innumerable wars in which mankind has been engaged in the past, is engaged now, or will be engaged in future. I do not care about European wars, Asiatic wars, African wars, or even American wars. I care only about wars in the United States.

Wars are actually going on in the United States today, and there is no use to blind ourselves to that fact. Pick up your newspapers and you will see that during the past year the Governors of forty-three out of our forty-eight states have called out the National Guard to enforce their decrees at the point of the bayonet. That is war. It is the kind of war that, started on a small scale in obscure localities, has swept like prairie fire over France and Russia. It is the kind of war which may eventually upset our theories of government.

FOR a long time the world's wars were caused by religion. More recently wars have been caused by politics. Our French and Indian wars were caused by worthy and successful efforts to rid this country of Indians, just as the corresponding wars in Mexico were for the purpose of exterminating Aztecs. The American Revolution was caused by our unwillingness to submit to a form of government that has been quite satisfactory to Canada. The Mexican War was caused by our desire to extend our holdings. The great Civil War was caused by squabbles that started before the Constitution.

*Commanding Third Field Army, Fort Sam Houston, Texas.



U. S. Signal Corps Photo

At the Headquarters of Supply, Tours, France, July, 1918.

Left to right: Brig. Gen. Johnson Hagood, Chief of Staff, Service of Supply, A. E. F., author of this article; the late Maj. Gen. J. W. McAndrew, Chief of Staff, A. E. F.; and Maj. Gen. J. G. Harbord, Commanding General, Service of Supply.

Sated with the blood of our countrymen, we turned our attention to other people's politics. We did not like the way things were going in Cuba. We wanted to teach the Filipinos how to govern themselves. We thought that Diaz was a tyrant, so we gave our moral support to Madero and precipitated anarchy in Mexico. Temporarily laying aside our fear of the Yellow Peril, we gave our sympathy to Japan against Russia. Subsequently we sent congratulations to the Russian Revolutionists when they overturned the throne of the Czar. We muddled in China and assisted in producing the present chaos which upset a form of government that had lasted since the beginning of the pyramids and substituted an interesting experiment that had been tried out many times and failed. We entered the World War to make the world safe for democracy!! Cervantes, we are here! Give us a Don Quixote who can parade as Uncle Sam!

It is foolish to say that wars are caused by bad men working for their personal interests, by profiteers, Army officers or robber nations swimming through blood to reach some treasure island. Wars are caused by earnest men fighting for their honest convictions. Men fight for their principles, fight for their homes, fight for some idealized form of government, fight to make other men accept their Gods.

It has been my good fortune to live among many peoples, to have had friends among all the races of men, to have heard both sides of many questions. And it has been my misfortune, perhaps, to have arrived at the pessimistic conclusion that the greatest menace to the peace of America today is a group of international meddlers who, unable to run their own affairs, are poking their noses into other people's.

The average young American honestly believes that his country has never been engaged in an unrighteous war. But there are young men of other countries who believe that their wars have been equally righteous. Can we say that the massacres of the Old Testament were any more righteous than the massacres of Genghis Kahn?

We believe in the freedom of the sea. Other people believe in the freedom of land. Japan took Korea in the interests of civilization. They bombarded Shanghai in the interests of universal peace. They set up a Manchurian government to stabilize the conditions of China. Might is right. And arbitration must be backed by force.

President Wilson said that without Article 10 the League of Nations would have no teeth, and he wanted no toothless League. Article 10 provided in effect for an international army and navy. To the military mind an international army and navy is the height of folly. To make war you must have a plan of campaign. It would be quite possible to hire soldiers and junior officers to fight against anybody for pay. But when it comes to the general staff and the

senior officers we should have but two alternatives, on the one hand a miscellaneous collection of spies conspiring together to defeat each other, and on the other hand a collection of traitors and scoundrels planning to assassinate their own countrymen to carry out the will of the majority.

THERE is a lot of talk about taking the profit out of war. Munition makers do not cause wars. Texas cotton went into the manufacture of German ammunition, and Uncle Shylock cannot be identified with any vocation or trade.

As between profit and loss, I am more interested in loss. In the World War we spent a billion dollars on artillery and never fired a shot except with borrowed guns and ammunition. We spent another billion on aircraft and never flew a combat plane. We spent another billion on ships of concrete and green lumber, none of which ever floated. We spent billions on food and clothing and shelter and equipment. We bought land for camps at five times its peace-time value. What difference who got the money? Doctors and druggists do not spread disease. Firemen do not cause fires. And Army officers do not cause wars.

During the World War I was Chief of Staff of the Services of Supply, the organization that handled all the munitions sent to France. With exception of small arms, we never fired a single round of American shot or shell. Our Engineer Corps used about one and a half million tons of general supplies, including 44 hundred miles of railroad track, 100 million square feet of steel, 100 million square feet of roofing, 25 million feet of copper wire, 10 million feet of pipe, 115 thousand miles of barbed wire, etc. Our Construction Department built 18 new ship berths—few seaports in the world have that many —225 miles of barracks, 127 miles of hospital wards, 80 miles of warehouses. The Quartermaster Corps received 7 million coats, 9 million pairs of breeches, 10 million olive drab shirts and 18 million undershirts, 13 million pairs of drawers, 9 million pairs of shoes, etc. The Signal Corps operated 125 thousand miles of telephone wire. It constructed a twenty-wire private line from G. H. Q. to Paris and another twenty-wire line to Hq. S. O. S., besides many other private lines between our activities in France. It laid and operated cable lines to our principal points in England. The Y. M. C. A., which worked under us, operated the largest chain of hotels and the largest chain of theaters in the world. It sold more tobaccos than any other business concern in America, besides giving away more than all other welfare agencies in France combined. The Transportation Department handled two million men and six million tons of general cargo. They erected 15 hundred standard-gauge locomotives and 20 thousand freight cars, brought over from the United States, besides repairing and putting to use two thousand unserviceable French and Belgian locomotives and 57 thousand freight cars.

All this shows that powder and shot does not make war. An Army crawls on its stomach. We cannot isolate war profits and graft. It is futile to say that war is caused by profiteers. When war comes we must mobilize the entire resources of the nation, and no greater blow could be struck at National Defense than to prescribe that the Government alone should manufacture munitions.

TESLA, the great scientist, in a recent copy of *Liberty* has predicted that within the next hundred years all war will be ended—not by a change in the human heart, not by arbitration, but by a machine of his own invention, which, he says, will make war now and for all time physically impossible.

He says: "Like other inventors, I believed at one time that war could be stopped by making it more destructive, but I found that I was mistaken. I underestimated man's combative instinct. We cannot abolish war by outlawing war. We cannot end it by disarming the strong. We cannot stop it by making the strong weak. But we can stop it by making every nation, weak or strong, able to defend itself."

That is the theory upon which we soliders work. We say the weak do not attack the strong, that only by adequate National Defense can we be safe against foreign aggression. There are many who believe that if Grover Cleveland or Theodore Roosevelt had been President in 1914, Germany would have realized the military strength of America and this country would never have been drawn into the World War.

Perhaps Tesla is right. He is credited with being the father of radio, television, power transmission, the induction motor, the robot, and the discoverer of the cosmic ray. Even he himself, however, does not look for immediate results, and while his machines may prevent the landing of hostile forces upon our shores, they would not seem to meet the situation of civil strife.

IN the meantime, to keep out of foreign wars the first and most practical thing to do is to keep out of foreign entanglements. Our refusal to go into the World Court was a loss to the peace of the world, perhaps, but a gain to the peace of America.

The next most practical thing to do is to provide for an adequate national defense. So far as I know the words "adequate national defense" have never been defined, so I shall define them here: a two ocean navy, each capable of standing off any other navy in our own waters, an army of citizen soldiers, capable of standing off any and every combination of powers that is likely to be brought against us in our own country. Such a system of national defense would not produce any very great burden upon the shoulders of the taxpayers, nor would it require any great sacrifice in the way of universal training and service. Two or three cents per day per capita in money, combined with a lot of brains, would give us such a system. The foundation is laid in the present National Defense Act and the cost of such a defense would be less than is being spent every day upon matters of much less importance.

As to wars within, I can only repeat that the weak do not attack the strong. Our best protection against riot, insurrection and rebellion—civil war—is a strong National Guard and a municipal, county and state government that is sufficiently close to the people and sufficiently honest in its administration never to use the Guard for any improper purpose.

You ask me the formula for Peace. Read the Ten Commandments and observe the Golden Rule. Be tolerant of others when it comes to other people's business. Be adamant when it comes to other people interfering with yours. Stop waving the bloody shirt and stop flouting the Stars and Stripes in the face of other people. Rid the country of undesirables, but at the same time rid it of corrupt politicians and of stupid, unenforceable laws that are contrary to the genius of our people. Leave European questions to Europe. Leave Asiatic problems to Asia. But first, last and always be sure that American questions will forever be left to America.

The Defense Act, Section 5-A

Our Magna Charta of Industrial Mobilization

By Earl McFarland*

THE Office of the Assistant Secretary of War has now been carrying on for many years. But our generation has seen it take a new lease on life and has watched it branch out from what General Benedict Crowell might long ago have characterized as a "small cemeterial affair" to a great planning organization—one of the greatest in the world.

Let us restate some of the circumstances surrounding the rebirth of this great division of the War Department. The one written sentence that prescribed the formula for the whole industrial preparation for war was that given in Section 5-a of the National Defence Act of 1920. This is the section that we refer to and read, time and time again—it is the keystone of the arch. Let us repeat it at the very outset of this discussion:

"Sec. 5-a. Hereafter, in addition to such duties as may be assigned him by the Secretary of War, the Assistant Secretary of War, under the direction of the Secretary of War, shall be charged with supervision of the procurement of all military supplies and other business of the War Department pertaining thereto and the assurance of adequate provision for the mobilization of matériel and industrial organizations essential to war-time needs. . . ."

"An article which presents nothing new!" So infers the author. But then there is nothing new about many things we are thinking and talking about these days—at least there would not be if we kept to first principles. While there may not always be something new on which to base a discussion, there is much value in recalling things, people, conditions and trends connected with our national policies. This discussion will recall principles and practices which may have slipped our minds. Perhaps the arrangement may emphasize some doubtful points. There is certain to be an awakened interest from a restatement of the principles of our industrial mobilization plans.—EDITOR.

Please note particularly the phrase in the section which reads "under the direction of the Secretary of War" because I shall refer of this again. Also, let me call attention to the two words "pertaining thereto," because these words limit the Assistant Secretary of War to matters pertaining to the procurement of military supplies and do not simply mean "other business of the War Department"—of this latter business there is much, which, of course, is handled under the supervision of the Secretary himself and never comes to the attention of the Assistant Secretary or of his office.

The organization of the Office of the Assistant Secretary of War is designed to meet the missions of the office. And these missions are defined by Section 5-a of the Act.

IF we look at an organizational chart of the War Department (page 273) we find the Secretary of War occupying the little square at the top, with the Assistant Secretary and the Chief of Staff occupying the two squares in the next echelon. The development of these two sides of the War Department into their various elements and sections, you are entirely familiar with. You are familiar also with the duties which are assigned to these elements and sections. But please notice particularly one peculiarity: the supply services, such as Quartermaster Corps, Ordnance Department, Signal Corps, etc., appear in this chart with two chiefs—under the Chief of Staff they operate in regard to their military functions and under the Assistant Secretary of War they operate in regard to their procurement functions. But in functioning in their dual capacity, we do not discover any over-lapping and very few border-line cases. The same relation exists in the office of the Assistant Secretary of War as exists in the offices of the General Staff in that they are entirely supervising agencies —they do not operate.

Now, which of the various duties of the Assistant Secretary of War is the more important—procurement planning, industrial planning for war, or current procurement? Let me cite for you a part of Mr. Woodring's last annual report. "I consider that part of my statutory duties dealing with industrial preparedness of prime importance. The subject 'industrial preparedness,' with its many ramifications and diversifications, is indeed a broad one. Its arteries, veins and nerves, affecting as they do the rights and welfare of our civilian body, both individually and collectively through business of every conceivable nature, merit study without end and of a high caliber. I feel that it is particularly unfortunate that the pressing nature of the current affairs of the Department, the determination of awards of contracts for supplies immediately needed, the settlement of disputes in the interpretation of contracts in force, and similar business questions requiring answers before activities can be begun and men put to work, have made demands on my time which have precluded my devoting to industrial war planning the amount of personal attention which I hope to be able to give to it in the future. My only alternative is to satisfy myself that the present set-up of my office is such as to give to this great responsibility the deliberate study it deserves. This I have done."

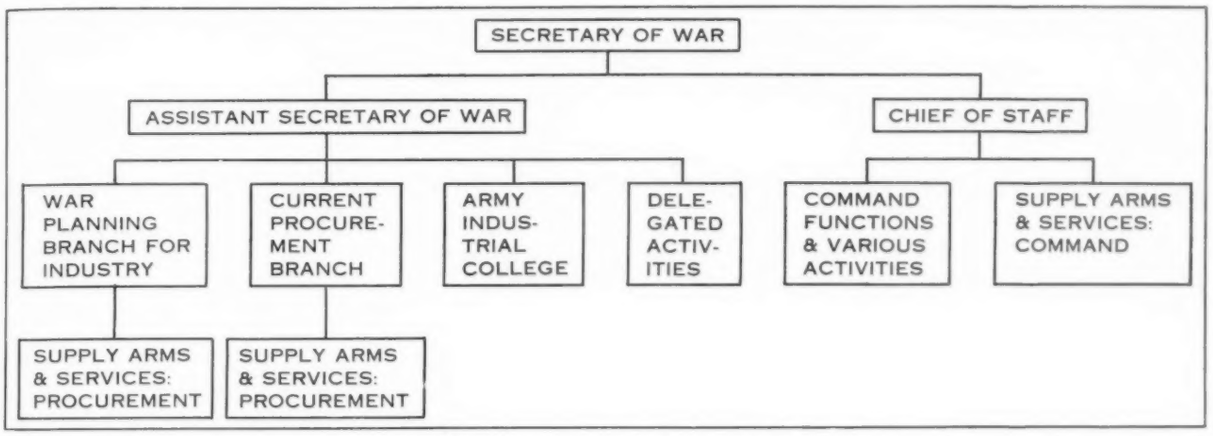
The organization of the office of the Assistant Secretary of War *has* functioned and we think *will* function, but I was so impressed a few days ago by a remark of Mr. George N. Peek of the old War Industries Board on the human element in organization that I would like to repeat what he said. Here it is:

"If there is any one impression I would like to leave with you today it is this. It is not the plan, it is not the moves that

*Executive Officer for the Assistant Secretary of War. Author: "Ordnance and Gunnery," 1929. Lieutenant Colonel, Ordnance Department, U. S. Army.

are laid out in advance that do the job, but it is *men*—just common everyday men that you want to rely on. . . . It is exactly the same in getting your supplies in time of war . . . . all the plans you may have in advance . . . . for supplying an army may be of no value unless you take into consideration the *human element*. . . . I want to emphasize the very great importance of keeping that human element alive in your preparations for emergency later on."

Though the human element is powerful—and may be all powerful after a plan is working,—the organization itself, especially under our condition of changing personnel, must be sound and logical, and the work must be done with whatever personnel may be available, until time permits more suitable or agreeable personnel to be selected.



WAR DEPARTMENT ORGANIZATION.

HAVING outlined the organization, let us see what is the background of this office of the Assistant Secretary of War. The first Assistant Secretary was one Thomas A. Scott, appointed by Abraham Lincoln in 1861. Mr. L. B. Ingersoll, librarian of the War Department Library, prepared in 1879, a history of the War Department in which he says, concerning this period of the first Assistant Secretary:

"The vast operations of the war thus rapidly sketched threw upon the War Department an additional amount of labors almost incredible. To supervise the administrative affairs pertaining to the Department during this long period of the republic's peril would have been beyond the capacity allotted to man. Early in the war Secretary Cameron, seeing the absolute necessity of direct aid in the discharge of his duties, by order made Colonel Thomas A. Scott 'assistant Secretary of War,' and he remained in the position during Mr. Cameron's further charge of the war office. Later, the office was created by law and eventually three assistant secretaries of war were authorized. These were P. H. Watson, John Tucker, and C. P. Wolcott. Upon the decease of Mr. Wolcott, Mr. Charles A. Dana was appointed. Mr. Watson, who had long been the law partner of Mr. Stanton was his principal lieutenant, and was consulted by him on all occasions of doubt and difficulty. Mr. Tucker had general charge of the matter of large contracts, and a special supervision of the chartering of steamers and steamboats. Mr. Wolcott had the supervision of the correspondence of great extent and variety growing out of the extraordinary circumstances of the war; as, for example, with the governors of States and other persons of importance or having business of unusual importance with the Department. Thus Secretary Stanton had about him and in his immediate direction a personal staff whose services during the war were invaluable."

But in 1866, the War being ended, the office of the Assistant Secretary was abolished, not to be re-established until 1890, 24 years later, during the presidency of Benjamin Harrison. The law re-establishing the office merely says: "There shall be in the Department of War an Assistant Secretary of War who shall be appointed by the President by and with the advice and consent of the Senate and shall be entitled to a salary of $4,500 a year, and who shall perform such duties in the Department of War as shall be prescribed by the Secretary or may be required by law."

This was the office about which Mr. Benedict Crowell, in 1918, made this remark: "The ancient office of the Assistant Secretary of War has long been more or less of a political sinecure; a place of considerable honor almost without practical value or responsibility. The office had become an eddy into which had drifted a few incidental and inconsequential functions, none of them directly related to the business of waging a war. It characterizes the office to say that its principal duty had been administering the national cemeteries."

However, we find in War Department Orders of 1890 and for the years following, directives showing the Assistant Secretary of War to be charged with numerous duties, including: Record and Pension Office business; clemency cases and prisoners at military posts; claims and accounts; sales of subsistence to civilians; privilege of occupancy of War Department land; open-market purchases, and other matters.

Between 1890 and 1917, Assistant Secretaries came and went, some well-known in their day and remembered now. But in 1917 began a series of Assistant Secretaries, all of whom are very familiar to us because of their interest in and association with the development of industrial mobilization and industrial planning. Let me give their names:

NAME	Whence Appointed	Date of Commission	Administration
Benedict Crowell	Ohio	Nov. 12, 1917	Woodrow Wilson
William R. Williams	Virginia	July 30, 1920	Woodrow Wilson
J. Mayhew Wainwright	New York	Mar. 28, 1921	Warren G. Harding
Dwight F. Davis	Missouri	Mar. 5, 1923	Warren G. Harding Calvin Coolidge
Hanford MacNider	Iowa	Oct. 16, 1925	Calvin Coolidge
Chas. B. Robbins	Iowa	Jan. 12, 1928	Calvin Coolidge
Patrick J. Hurley	Oklahoma	Mar. 15, 1929	Herbert Hoover
Frederick H. Payne	Mass.	Apr. 29, 1930	Herbert Hoover
Harry H. Woodring	Kansas	Apr. 16, 1933	Franklin D. Roosevelt

HOW did the present organization of the Office of the Assistant Secretary of War, *i.e.,* the designation of duties to the Assistant Secretary of War, come about?

In 1903, the Congress of the United States acting under the stimulus of that grand statesman and friend of the Army, the then Secretary of War, Elihu Root, created the General Staff of the Army. I quote a few extracts from the General Staff Act:

"The Chief of Staff, under the direction of the President, or of the Secretary of War, under the direction of the President, shall have supervision of all troops of the line and of the Adjutant General's, Inspector-General's, Judge Advocate's, Quartermaster's, Subsistence, Medical, Pay, and Ordnance Departments, the Corps of Engineers, and the Signal Corps, . . ."

". . . All officers detailed in the General Staff Corps shall be exclusively employed in the study of military problems, the preparation of plans for the national defense, . . . and hereafter members of the General Staff Corps shall be confined strictly to the discharge of the duties of the general nature of those specified for them . . ., and they shall not be permitted to assume or engage in work of an administrative nature that pertains to established bureaus or offices of the War Department, or that, ... would involve impairment of the responsibility or initiative of such bureaus or offices, ... Provided . . ., That all pay and allowances shall be forfeited by any superior for any period during which, by his order or his permission, or by reason of his neglect, any subordinate shall violate any of the foregoing provisions of this section . . ."

It is quite evident that Congress intended to have its mandate carried out.

Prior to this time, 1903, the supply bureaus of the War Department had become powerful machines in the Army and in politics. Their relation to the troops of the line might have become a case of the "tail wagging the dog," and the General Staff Act should have remedied this condition. But regarding these points of issue the Judge Advocate General of the Army stated: "Unmistakably, whether wisely or not, Congress has sought to preserve untouched the special jurisdiction of each of the several bureaus of the War Department. . . ."

And we know that immediately prior to our entrance in the World War the supply bureaus were practically independent of the General Staff and of each other. Whether on account of the law or because of the strength they had built up, they had managed to resist General Staff control.

The World War showed, I think, that the efficiency of our General Staff in its distinctly military functions and in its staff training, was greatly superior to the efficiency of the supply departments, in their functions of procurement and industrial relations.

So we saw, as a result, the difficulties and the changes in which the supply bureaus were involved in the latter part of 1917 and in 1918. And it was at this time, November 12, 1917, that Mr. Benedict Crowell was appointed the Assistant Secretary of War, and it was his experience between this date and November 11, 1918—one year to a day—that gave him such strong convictions regarding Section 5-a of the National Defense Act of 1920.

At this point, I would like to insert extracts of testimony before Congressional Committees regarding this section.

Concerning reorganization of the War Department at the end of 1917, Mr. Crowell stated: "When things began to go wrong with the war industrial program, the Secretary of War saw in this unused office (of the Assistant Secretary of War) the opportunity to give to the War Department the thing which it then most sorely needed—industrial ability at the top of its organization. In November, 1917, he called to the office a man whose training and experience had been entirely in the industrial field, and turned over to his administration all the industrial activities of the War Department—gave to him literally a blanket commission to rescue our war industry from the plight into which it had fallen . . . . and . . . . thereafter the Assistant Secretary of War was the industrial head of the War Department."

MR. CROWELL'S testimony before this committee showed that he wanted the Undersecretary of War to be the Director of Munitions and charged by law directly with full responsibility for all activities relating to munitions supply. That is, he would divorce the Undersecretary from the Secretary, and set up an agency independent, at least in its procurement activities, from the remainder of the War Department. From Mr. Baker's testimony we shall see that the words "under the direction of the Secretary of War," appearing in Section 5-a, were inserted because of the testimony of Mr. Baker himself. It would be very interesting to speculate on how the War Department would now be functioning and what the status and organization of our office would be if those few words "under the direction of the Secretary of War" had been omitted.

Mr. Crowell's testimony continues:

"The Chairman: Would you have the Director of Munitions an Army Officer?

Mr. Crowell: No, a civilian.

The Chairman: You would not even commission him?

Mr. Crowell: No, I would not.

Senator Chamberlain: Why?

Mr. Crowell: It is a question for a man with an industrial mind, and I do not think it is possible to find such men in the Army. I think it is important that he should retain his civilian status. His dealings are all industrial dealings with the great industries of the country, and I see no advantage to be obtained by putting him in uniform."

A very good statement, I think, and still applicable.

And about this same time, we have the Chairman of the House Military Affairs Committee, Mr. Hull of Iowa, a helpful friend of the Army, saying: "To speak frankly in reference to this, this subcommittee is a little weary of the friction that exists between the bureaus and the staff on the one side, and between the different bureaus themselves; and if we could get it straightened out in the law, prescribing certain general principles, by which the bureaus would govern themselves, and the General Staff govern itself, we would be happy."

And then we hear Mr. Baker: "My assistant, Mr. Crowell, is very much in favor of having an inelastic statutory provision which will put the supply bureaus under the Undersecretary. I think he is wrong about that. He and I have talked it over many times and I think he is wrong for this reason: He believes that in times of peace you can get a man to be Undersecretary of War who is a captain of industry and has had so much business experience that he can be safely intrusted with such responsibility and not be subject to very much supervision by the Secretary of War in the administration of the supply bureaus. I do not believe that. Ordinarily, I think you can get men of prominence and large experience to hold the cabinet offices or the first places, but I do not believe that

ordinarily you can look forward in times of peace to getting men of very large experience to occupy the undersecretaryship or the assistant Secretaryship.

"I make no reflection whatever upon the men who have held these places in the War Department, or any other department; they have been men of good quality, but you can not look back upon the Undersecretaries of any public department, with now and then a striking exception, and discover men who have been very largely successful in private affairs."

Then he goes on to say:

"... Let me illustrate what I have in mind. If the Secretary of War is a lawyer, like Mr. Root or Mr. Taft, he would undoubtedly want as an assistant or undersecretary a man of very large industrial experience, if he could get him, to have charge of the supply bureaus. That would be where he would feel the need of assistance most. But suppose the Secretary of War is a man like Mr. Schwab—and I can easily imagine Mr. Schwab being Secretary of War—if Mr. Schwab were Secretary of War he would not want someone else to be in charge of the supply bureaus and Ordnance Department; that would be the part of the job he would want for his own special talents, and he would want a lawyer, probably, as undersecretary, a man who could deal with the intricate legal problems that are constantly arising in the War Department."

THUS was developed the familiar Section 5-a, which—in our industrial functions—becomes the text for every sermon we preach and the authority for everything we do. But this Act, which controls such a vital part of our efforts, itself contains an anomaly. It says that the duties of the *General Staff* shall be, among other things, to prepare plans for the mobilization of the Nation's *material* resources in an emergency. But Section 5-a charges the Assistant Secretary with "the assurance of adequate provision for the mobilization of matériel and organizations essential to war-time needs."

It appears that the provision in the law pertaining to the Assistant Secretary was *new;* and that pertaining to the General Staff was *old,* having occurred in the National Defense Act of 1916, and was not changed to make it consistent with the new provision of the law.

However, in the summer of 1921, the often mentioned Harbord Board with Major General James G. Harbord as its head, met in Washington to study and report on various phases of War Department organization. The conclusions of the Board are comprehensive, very interesting, and very important.

In defining the duties of the General Staff, the Board did not omit the words "material resources" but in the General Orders that followed and in the Army Regulations of today, these words *are* omitted, thus removing any doubt or danger of conflict concerning the duty and responsibility of planning for the mobilization of the material resources of the Nation—this duty is left exclusively to the Assistant Secretary of War.

There is a feeling among some students of Army affairs that the Assistant Secretary of War should be removed as one of the principal characters in the current War Department picture and placed in the scenery merely as a "stooge" without statutory responsibilities—in the position occupied by the Assistant Secretary of War prior to the arrival of Mr. Crowell. In order to see the problem in the full light of facts, one of the student groups at the Army Industrial College a year or two ago submitted a study, which proposed that the present statutory duties of the Assistant Secretary of War be removed from his charge and become the responsibility of a second Deputy Chief of Staff; that there be two Deputy Chiefs of Staff: one charged with supervision of functions now exercised by the General Staff, the other charged with the statutory functions now exercised by the Assistant Secretary of War. A chart of such an organization would be merely a straight line chart, showing the Secretary, the Assistant Secretary and Chief of Staff in the main vertical column with the First Deputy Chief of Staff and the Second Deputy Chief of Staff branching from the rectangle representing the Chief of Staff. The organizations under the first and second deputies would, in turn, be similar to the organizations now under the Deputy Chief of Staff and the Assistant Secretary of War.

The advantages of this plan, as found by this student group, were only two: 1. Simplification of procurement management structure. 2. Improved liaison between using arms and supplying services.

The disadvantages listed included: 1. Change of statute and abandonment of present procurement planning structure in vogue since 1920. 2. Abandonment of progress in organization and in indoctrination. 3. Abandonment of management structure which has been satisfactory. 4. Navy Department might not coöperate with Army General Staff. 5. Planning Section of General Staff could not be expected to function better than present planning section of OASW. 6. General Staff not suited for civilian contact. 7. General Staff is organization of men not trained along lines of industry or political economy.

I see no merit in such a proposal; and, frankly, I don't think it worth worrying about because I feel sure that the informed industrial interests of the country and the informed members of Congress are thoroughly in accord with the present organization, and that if a reorganization along the lines mentioned should be proposed, it would have violent opposition and meager support.

IN addition to these statutory duties that we have been discussing, the Assistant Secretary of War has "such other duties as may be delegated by the Secretary." These delegated duties are important. They are listed in Orders E, a War Department publication which is not given general distribution but which is of frequent use in the offices of the Secretary and the Assistant Secretary. Orders E specifies that the Secretary of War reserves to himself final action upon papers relating to certain subjects which are listed. The orders then assign to the Assistant Secretary of War, the supervision and necessary action upon matters including: All his statutory duties and certain non-statutory duties which, from time to time, have been delegated to him by the Secretary. Some of the more interesting of these latter may be enumerated:

The sale or disposal of surplus supplies, equipment, plants, land or other facilities.

Claims, foreign or domestic, by or against the War Department, including those resulting from the operation of aircraft.

The purchase and sale of real estate; the lease of real estate for the use of the War Department; the granting of leases or licenses, etc.

Clemency cases in mitigation or remission of sentence by courts-martial.

The activities of the National Board for the Promotion of Rifle Practice and Civilian Marksmanship.

Matters relating to national cemeteries.

Regulations for burial expenses of deceased personnel.

For these delegated duties, the Assistant Secretary of War actually becomes the Acting Secretary of War, and is removed from the square he usually occupies on any chart of the War Department and occupies the same square as the Secretary. Thus, he has the facilities not only of his own office but of the whole War Department at his disposal and can use any in its proper sphere. If, in his delegated duties, he becomes involved in a question which pertains to one of the General Staff sections it is entirely proper for him to refer the question to the Chief of Staff or to the Adjutant General instead of referring it to the officers in his own organization. In dealing with these matters, he merely becomes the agent of the Secretary and handles the questions exactly as the Secretary would have handled them, that, is, through the Chief of Staff and the General Staff branches and divisions concerned.

I mentioned Mr. Peek's remark that regardless of perfection of paper organization, the personal element was more important than the chart. So in the relation of the branches of the Assistant Secretary's office, the personal contact establishes the relationship. I am sure each section knows what the other is doing and that there is complete harmony and understanding. I can say also that our relationship with the General Staff is harmonious and friendly and, though we have had some bitter disagreements, we think we have settled them as amicably as have the different divisions of the General Staff settled their own differences.

The Assistant Secretary of War has a representative on the Budget Advisory Committee of the War Department so we have a voice in that most important activity of the Army. The Executive Officer of the Assistant Secretary of War is a member of the General Council—that very powerful body composed of the Assistant Chiefs of Staff (the "G-s") and the Chiefs of Arms and Services of the War Department. And the Congress itself has created the War Council—consisting of the Secretary of War, the Assistant Secretary of War, and the Chief of Staff. The meetings of the War Council are a most important feature of the operation of the War Department. They draw together the three chief officers in a close and informal way, permit each to become acquainted with and understand the difficulties and the problems of the other, and develop a mutuality and friendship that makes coöperation easy at a time when you expect it to be hard.

The law reads: "The Secretary of War, the Assistant Secretary of War, the General of the Army, and the Chief of Staff shall constitute the War Council of the War Department, which council shall from time to time meet and consider policies affecting both the military and munitions problems of the War Department. Such questions shall be presented to the Secretary of War in the War Council, and his decision with reference to such questions of policy, after consideration of the recommendations thereon by the several members of the War Council, shall constitute the policy of the War Department with reference thereto."

In speaking of the War Council, the Harbord Board says: ". . . . the law definitely brings about within the War Department organization, that essential element of military efficiency, the subordination of *administration* to *command,* by placing upon one authority (the Secretary of War) the decision as to questions of military policy."

This War Council is a fine institution—little talked about but of great effectiveness.

In conclusion, let me add one idea; and I'll put this idea in the words of Mr. Frank Scott, first Chairman of the General Munitions Board and later of the War Industries Board, of whose great public service you all know. In answer to a question, after a lecture before the Army Industrial College a year or two ago, he said: "We are pretty well prepared to procure necessary war supplies for the next war. Our plant capacities are worked out and allocated, and we have sufficient capacity for the war effort. We can get munitions and guns and airplanes and trucks. It looks encouraging for us. *But,* all of these plans are based on the *last* war! I want to ask you if the next war, industrially, will be like the last one?"

International

The Makeshift Tanks of the German Army Under the Terms of the Versailles Treaty.

Broad-minded Mahan

The Admiral Who Balanced the Value of Land and Sea Forces

By W. D. Puleston*

MAHAN has become so widely recognized as the expo-nent of seapower that some readers may naturally be surprised that he should be chosen as the subject for an article in a military journal. Yet few writers on war have had a more precise appreciation or have given a fairer presentation of the relative values of fleets and armies than Mahan. The neat balance between the land and sea forces achieved by Mahan was not the result of happy chance for although educated at Annapolis he was reared at West Point. His father was a graduate of the Military Academy and for over forty years was a professor there. As a child, Mahan knew Col. Robert E. Lee when Superintendent, and his great opponent George B. McClellan; it was hardly probable with such an early environment that Mahan would ever omit the Army from his consideration.

In addition, it was Commodore Luce, founder of the Naval War College, who gave Mahan his opportunity to develop his latent talent—when Luce summoned him to the College Staff in 1884. At that time a modern treatise on naval warfare did not exist whereas Jomini, Clausewitz and Hamley had each contributed notable books on land warfare. Luce's conception was that steam would permit a positive action of fleets denied them during the long era of sailing ships. Admiral Sir Howard Douglas, of the British Navy, had already pointed out the analogy between fleet tactics and army tactics. Luce was convinced that the underlying principles of army operations could be applied to fleet operations, and he asserted that "If with the study of military science the naval student carries on a parallel course of naval history, he will be enabled to group together in an intelligent manner certain classes of facts, by the generalization of which he may formulate for himself principles for his guidance as the commander of a sea-army (fleet) preparatory to and during war." This was the Luce method of developing a naval science, and after a careful scrutiny of the Navy list he selected Mahan to "undertake the subjects of naval history and tactics."

In the introduction to his "Naval Strategy," Mahan has described his method of developing his subject. He writes ". . . it was thus I approached the study of history as a military record. From Jomini's 'Art of War' . . . supplemented by his 'History of the Wars of the French Revolution' in which he gives history accompanied by strategic and tactical discussion of events, I went on to write the course of historical lectures which subsequently were published under the title 'The Influence of Sea Power Upon History.'" That is to say, Luce clearly visioned, and Mahan brilliantly executed, the idea of adapting principles underlying land operations to sea operations.

In this same introduction Mahan quoted with approval the noted French writer on naval strategy Daveluy's statement "History being the record of experience, if exhaustively studied, brings out all the variable factors which enter war," therefore, in Mahan's judgment, history supplied all the qualifying factors so necessary in applying general principles to specific situations. In the jocular but wise words of Capt. McCarty Little, U. S. N., a devoted colleague of Luce and Mahan in the early days of the Naval War College, "Principles apply when they *do* apply." Speaking of the relative value of formulated principles and history, Mahan says, "Each is a partial educator; combined, you have in them a perfect instructor. Of the two history by itself is better than formulated principles by themselves; . . . history being the narrative of actions takes the role which we commonly call practical." Thus, while Mahan continually made use of the term "principles" of strategy, it is plain that he used the term in a less complete sense than is the dictionary acceptation of the word "principle" as something of eternal and universal application. And in the recent army discussion of a fixed number of immutable principles of war, Mahan would most certainly have joined those who question whether the operations of war have been or can ever be restricted to certain thumb rules, solemnly labeled "immutable principles."

There was one very unhappy result from using military examples to develop naval principles, and that was the indignation it caused among some of the salty gentlemen who attended the early sessions of the college and could not see why they should sit and listen to the rather long drawn-out dissertations concerning the campaigns of Archduke Charles along the banks of the Danube. And it must be confessed that while some of these operations clearly showed the advantage of "concentration" or "interior lines," their application to naval tactics might have seemed a trifle far-fetched to many among those early sea-going classes. If gossip be true, there were many deep-throated sailor growls at having to listen to tales of fighting ashore. Undoubtedly Mahan, a proper sailorman himself, would have preferred to use naval models but they did not exist—he was a naval pioneer.

LUCE also requested help from the Army and 1st Lieut. Tasker H. Bliss was detailed to give a series of lectures on land tactics. It is needless to say that Bliss, with his fine mind, also proved an excellent selection for this work. In this violent manner did Commodore Luce, a robust but scholarly veteran of the Civil War, create a Naval War College to study naval warfare and fleet operations, when we did not have a fleet. Luce met the usual opposition offered to those who seek to create a new institution; his scheme was derided by the "blue water" school of officers who thought four years at the Naval Academy was enough education for any naval officer. They dared not accuse Luce of being "impractical," the favorite attack used by the mentally indolent against any one proposing adult education, for he had shown too much ability at sea during the Civil War, but they fought the College on various pretexts and twice succeeded in closing it.

The protective care of Luce was necessary because Mahan was not only modest but sensitive, had an ill-concealed contempt for those opposed to the College, had little desire to thrust his ideas upon reluctant brother officers, and wondered

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International

Coast Defense Ashore.

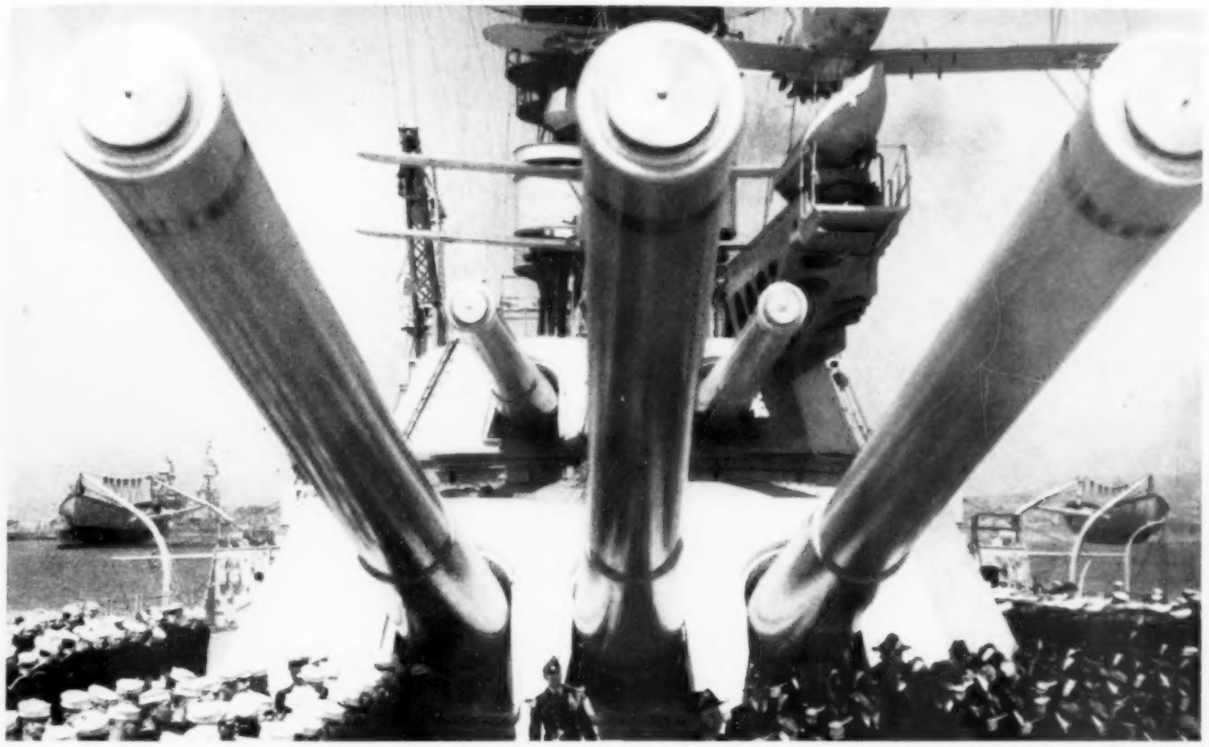
why he should persist with his lectures at the College if the Navy didn't want them. Luce, much more aggressive, was determined that the Navy should have a War College and correctly believed that in time the officers would learn to appreciate it. As he lived to a ripe old age, he finally saw the Naval War College prosper and had his triumph, but many years after Mahan had achieved fame.

THUS it happened that Mahan, already reared in an army atmosphere, was forced to turn to army models to develop his own ideas of naval warfare. So it is not surprising that though his theme was sea-power the army is never forgotten. More than this, a study of Jomini soon taught Mahan the proper role of the statesman in war and throughout his writings his point of departure is invariably the objective of the statesman, whether an autocratic ruler, a president, or a chief-of-cabinet. This generous mental attitude has preserved Mahan, a naval officer, writing primarily of the naval aspects of war from underestimating the contributions of either the diplomat or the soldier. Nowhere in his books will be found any semblance of the cheap sneer that "We never lost a war, nor won a peace conference" for Mahan knew that the armed forces have not always prospered, that just as statesmen sometimes turn over difficult situations to admirals or generals, so defeated generals or admirals very often are obliged to call upon diplomacy to retrieve as much as possible of the nation's interests. Mahan knew that the diplomacy of Lincoln in Washington and Charles Francis Adams in London was as necessary to preserve the Union as the victories of Faragut and Grant. He knew that Talleyrand truly served France after Napoleon's defeat at Waterloo. He did not hesitate to criticize an individual statesman just as he condemned certain admirals and generals, but he indulged in no indiscriminate condemnation of statesmen at home or abroad as a class.

Mahan commenced with the deliberate purpose of emphasizing sea-power, yet his judicious temperament and his knowledge of the other leading factors that enter into a nation's ability to wage war saved him when he wrote from over-emphasizing the Navy. He believed "That control of the sea was an historic factor which had never been systematically appreciated and expounded." For above twenty years he developed his thesis. And just as he did not over-estimate sea-power neither did he exaggerate his own contribution to the subject for he very modestly limits his claim to popularizing and making effective an argument that Bacon and Raleigh "had epitomized in a few words." If he erred at all, he understated his claim to fame.

IN addition to native ability and early environment Mahan was fortunate in his choice of books. A British army officer, Colonel Napier, author of "Peninsular War" revealed to Mahan in his brilliant but painstakingly accurate descriptions of the campaigns of Moore and Wellington against Napoleon and his marshalls to Spain "the military sequence of cause and effect." Napier apparently inspired Mahan to try his own pen for shortly after studying the Peninsular War he wrote his first book "The Gulf and Inland Waters" descriptive of our naval operations in the Civil War.

The next author to definitely influence Mahan was Mommsen, whose accounts of Hannibal's Campaigns in the History of Rome, fixed Mahan's attention on the value of control of the sea. Thus, Mommsen points out that in order to seriously threaten Italy a nearer base for Hannibal's "operations was requisite than Spain or Africa," and Mommsen continues "Hannibal could only rely for support on a fleet and fortified harbor for Rome was now Mistress of the Sea."



International

COAST DEFENSE AFLOAT.

Mahan had cruised in the Mediterranean. His quick mind caught the full truth of Mommsen's proposition and he tells us how while reading Mommsen in the English Club at Lima, "It suddenly struck me . . . how different things might have been could Hannibal have invaded Italy by sea . . .; or could he, after arrival have been in free communication with Carthage by water." This was the "clue" that Mahan followed in his developments of the many campaigns that he analyzed to prove the influence of sea-power on history.

From Jomini, Mahan learned many things, among them the importance of coöperation between the statesman and the general, it naturally followed that in our situation an even closer understanding was necessary between the statesman and the admiral; next Jomini's dictum "that the organized forces of the enemy were ever the chief objective" became a fixed idea with Mahan. From Jomini's expression "The sterile glory of fighting battles merely to win them" Mahan advanced to the thought that "War is not fighting but business"; that is, victories were useless unless they advanced the purpose of the war. Mahan also improved another tenet into one of his own "War is simply a violent political movement," thus approximating Clausewitz's clear thought "War is a continuation of peace-time policy by force." Apparently Mahan was not at this time acquainted with Clausewitz, but in studying Napier, Jomini and Mommsen he had drawn upon some of the best military and historical thought in England, France and Germany.

To this military background Mahan added from Martin's History of France a thorough acquaintance with Colbert's commercial policy and he began to appreciate the close relationship between "commerce and a navy," this caused him to study "trade statistics as indicative of naval or political condition deflecting commercial interchange, and influencing national prosperity." With Martin's History he studied Campbell's "Lives of the Admirals," which he found well designed to enable a naval student "to understand the naval operations; but more than this, maritime occurrences of other sorts, commercial movement, and naval policy are presented clearly, and with sufficient fullness to illustrate the influence of sea-power in its broadest sense upon the general history." Other authorities used by Mahan were James, Lediard, Entick, Beatson, Hoste, Troude, and Guerin, together with contemporary contributors like Admiral Colomb of the British Navy and Professor Laughton.

WITH the preparation already outlined and using his lectures as basic material, Mahan began writing in 1890. Mahan rarely consulted manuscripts, he usually depended upon authorities already published. He had the privileges of the Astor Library, "rummaged its well-stocked shelves, following up every clue, especially numerous pamphlets and magazines" that might contain material pertaining to his subject. In his "Life of Nelson" he made a "careful study of Nelson's voluminous correspondence" and thanks to Earl Nelson and other English friends, he was able to use some original source material.

His first book "The Influence of Sea Power Upon History 1660-1783" commenced the series upon the same theme that really ended with "Sea Power in Its Relations to the War of 1812"—this book, completed in 1902, was his last extensive work. Another dozen years was given to magazine articles, shorter but packed with truth and timeliness. Thus, his series of articles entitled "Armaments and Arbitration," published in 1912, bring his thoughts up to the eve of the World War, whose approaching shadow he clearly saw.

In his preface he writes that the series is intended to present

the argument, too frequently ignored, that arbitration cannot always take the place of force. He also pointed out in reply to the attacks by economists on war, some wars that had proved immensely profitable to the victor. He need not have gone beyond the history of his own country for his last illustration. But Mahan is most convincing when he points out that if we had not resorted to force we would not have gained our independence nor preserved the Union.

MAHAN'S writings are a gold mine for the military student. And if he were alive today how easily could he refute those loose thinkers and plausible writers who have attempted to make a reputation for themselves by despoiling his "dead skin." They could not have faced him alive. He disposed of the arguments of Norman Angell, the pretentious progenitor of the present numerous brood of pacifistic writers, and his Great Illusion as neatly as did Nelson of Villeneuve. He could point out the heresies of those meek moderns who to avoid the problems of foreign trade would confine American interests and trade to her own continental limits. He could have demolished the arguments of those agrarians who would sacrifice our merchant marine and foreign trade as easily as he did the Jeffersonian thesis of protecting our shores by gunboats. Unfortunately, he is not with us today to enlarge his theses and any bright young collegian or parochial-minded economist can attack them; some magazine editors publish these articles as interesting or profound whereas they are only startling and will not bear analysis. But let Mahan's critics and our would-be isolationists be sure they cannot keep the future generations of Americans from sailing the seven seas or from flying their planes high up over the oceans.

Perhaps the most useful application of Mahanism today could be given to those misguided members of various undergraduate bodies who, in the mature wisdom of the campus, have decided they will not prepare themselves for war and will not fight until their country is invaded. Mahan would have told them that if they do not voluntarily submit to discipline they, like any other mob, educated or uneducated, will be at the mercy of any group of able bodied men who are willing to accept discipline. If they are unwilling to defend their interests on the high seas they will be at a tremendous disadvantage when they attempt to defend their own extremely extensive coast line. Once decisively defeated afloat the country will be open to invasion and their belated willingness to fight will be of little avail. The Grecians were more highly civilized than the Romans and became their vassals. The Romans were more highly civilized than the conquering Huns and when they ceased to do their own fighting they too succumbed. All these vital factors in the lives of nations are passed in review by Mahan and only those who are hidebound mentally can fail to see the reasonableness of Mahan's writings and their application at the present time. That is what makes Mahan eternally fresh and continuously contemporary.

ALTHOUGH Mahan formed the opinion that good men were more important than good ships, he knew that better men could be depended upon to construct better ships; he was aware of the great progress in the development of naval material that occurred during his own lifetime, he realized it was necessary that ships and munitions of war be modernized. Throughout his writings, particularly in his early days, he stressed the neglect of the material of our fleet. He pictures, more than once, the growing modern European navies and contrasts them with our ships, those relics of the Civil War that then formed a large part of our Navy. He knew that such ships would only be coffins for brave sailors in the event of war with a first class fleet. He knew that shipyards and munition factories were as necessary as the fighting ships themselves, and realized that shipyards and munition factories could not be extemporized in time of war, that they must be created and sustained in time of peace.

Mahan emphasized that naval bases properly equipped were necessary to sustain and strengthen fleets just as fortifications, properly located, are necessary on land—to free the mobile army for the offensive and to assist in maintaining its line of communication. He employed Gibraltar as the classic example of a proper fleet base and showed how dependent the Mediterranean Fleet of Great Britain was on this stronghold defended by the army, but he was too wise to be imposed upon by any ill-informed army officer who might assert that the army alone could defend Gibraltar. He showed how helpless the garrison of Gibraltar would have been without the fleet which guaranteed its subsistence and communication with England. And this thought of Mahan's should be emphasized—this inter-dependence of army and navy—so continually exemplified in Mahan's writings. It is absolutely essential to the Army, to the Navy, and to the country that there be close coöperation between the Army and Navy. In time of war the Army and Navy together can be our sure defense against any enemy at home and abroad. Only an ill-wisher of our country will ever be guilty of driving the thinest wedge between our two armed services.

DURING 1911 Mahan revised and somewhat enlarged his original lectures at the War College, that he had been giving for a quarter of a century. These lectures may be considered his mature reflections. The introduction of these lectures may be regarded as his last direct message to his brother naval officers; his final word to them was "Master, and keep track of, the great current events in history contemporary with yourself. . . ." He warned his brother officers to avoid dissipating their energies upon domestic questions, he believed "The sphere of the Navy is international solely. It is that which allies it so closely to that of the statesman. Aim to be yourself statesman as well as seaman."

It was not Mahan's intention to urge naval officers to usurp the statesman's place for in this same introduction he wrote that only by the coöperation of "statesmen, military men, and naval men could our country be efficiently served in war time," and he added that "in order that their coöperation may be adequate, each must understand the conditions by which the others are controlled." Before the World War, Great Britain, more wisely than his own country, took to heart the first great thesis of Mahan and maintained the world's most powerful fleet. Britain failed to grasp Mahan's second great thought, namely, the necessity of cordial coöperation between the "statesmen, the military men and the naval men." Gallipoli, Mesopotania and Palestine were more costly teachers than Mahan but Britain learned and now at the College of Imperial Defense in London career men of the Foreign Offices, officers of the British Navy and Army gather together to undertake a joint study of the Empire's problems. But Mahan's own country still hesitates to establish a similar institution—yet in our vanity we speak of Great Britain's "muddling through." We should remove the "beam from our own eye."

Philadelphia's Ordnance Day

Industry and the Army Observe A District Anniversary

By Donald M. Kerr*

PROBABLY every reader of this issue of ARMY ORDNANCE has read parts or all of Secretary of War Dern's speech (page 263) given in Philadelphia on Tuesday, March 26th. To those of you who have wondered why the Secretary should go to Philadelphia in order to deliver such an address, this article will be of interest.

The twenty-sixth of March marked the seventeenth birthday of the Philadelphia Ordnance District, one of fourteen such districts which has continued to function during peace time with the same efficiency as during the trying days of 1918. Originally organized under the able leadership of Mr. John C. Jones, the District has carried on its work under the direction of the present Chief, Mr. Philip H. Gadsden. For some time Mr. Gadsden and those men who comprise his advisory committee had felt a suitable tribute should be paid to Mr. Jones as a recognition of his war-time services. In October of 1934 it was finally decided to pay this tribute on the seventeenth anniversary of the District.

The Philadelphia Post of the Army Association rolled up its sleeves and set to work. Mr. Gadsden, as Chief of the District, was able to ask for and receive some of the finest coöperation which has ever been given by various branches of the Army. Equipment and troops were loaned by Aberdeen Proving Ground, Raritan, Frankford, and Schuylkill Arsenals, Forts Myer, duPont, and Monmouth. The Schuylkill Arsenal arranged to take care of the men during their stay in the city and the First City Troop placed their Armory at the disposal of the District for storing the equipment overnight. The Chamber of Commerce coöperated by making the necessary contacts with the City officials. Together the Chamber and the Philadelphia Post sponsored the testimonial dinner given for the Secretary as a climax to his visit.

Coördinating the various phases of the day's activities naturally fell upon the shoulders of the Philadelphia Post and the result was a splendid example of what can be done by a reserve organization when everyone does his part.

Among the equipment which arrived in the city on Monday preceding the Secretary's visit were four of the new scout cars. The Philadelphia Post and the First City Troop took advantage of this to hold a joint meeting at the Armory and learn at first hand the purpose of this new motorized equipment. So far as we know this was the first time any of this material was actually demonstrated to an organized group of Reserves and National Guard. They learned that the scout cars were designed to fill in the gap now existing between the airplane pilot and the mounted scout, and instead of replacing the mounted scouts, as has been the current belief, the cars really leave the mounted patrols free to do their own job much more efficiently. On Tuesday even the Weather Bureau gave its best coöperation. Perhaps it would be most interesting for the reader to follow the day's events as they unfolded before the eyes of the official party.

Hood-Weintaub

THE SECRETARY OF WAR INSPECTS AN ANTIAIRCRAFT GUN.

Hon. George H. Dern at the Ordnance Display in Philadelphia, March 26, 1935.

PHILADELPHIA newspapers, having been informed ahead of time regarding the exhibition of ordnance material and the visit of the Secretary ran an advance story in their Sunday issues. Net result: the Secretary's office had a small flurry of telegrams on Monday from all the local pacifist organizations. The protest being expected, it did not cause anyone a great deal of alarm; however it did raise civilian interest in the exhibit considerably higher than if no protest had been made, so all were apparently pleased.

To the minute, 12.38 marked the time of arrival on Tuesday of the Secretary and his party from Washington. They were met at the Pennsylvania Railroad 30th Street Station by Mr. Gadsden and a group of local officials. Colonel U. S. Grant 3rd had brought up the 1st Engineers from Fort duPont to act as the Escort of Honor for the arrival. Following their inspection the party was taken to the Bellevue-Stratford Hotel for a private luncheon given by Mr. Gadsden.

Three o'clock in the afternoon and once more Philadelphia's oldest and most colorful military organization turned out to escort an honored guest. The First City Troop, organized in 1774 and active continuously since that date, is a troop any city would be proud of. Wearing their traditional huzzars uniforms they provided a striking display as they escorted the Secretary from the hotel to the City Hall.

On the north side of the Hall is Reyburn Plaza. Here the ordnance display had been set up and the necessary speakers' stand erected. Also, very much in evidence, was the Police

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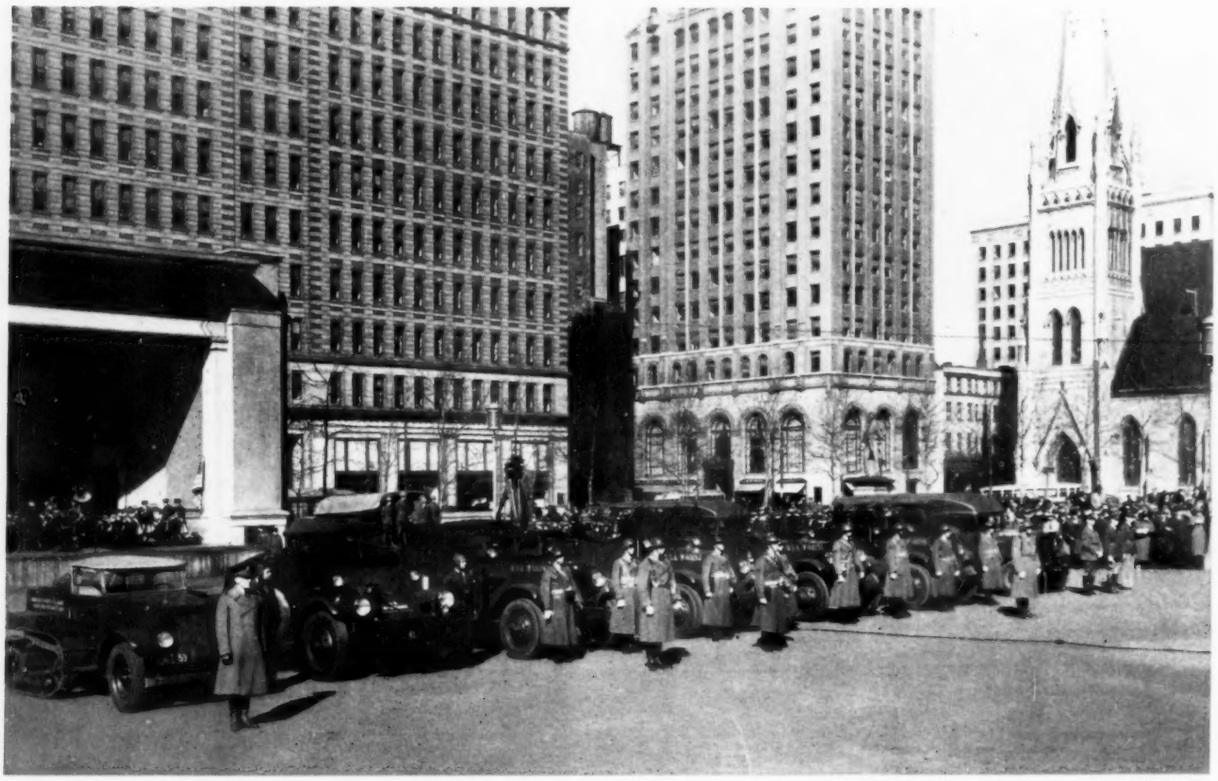
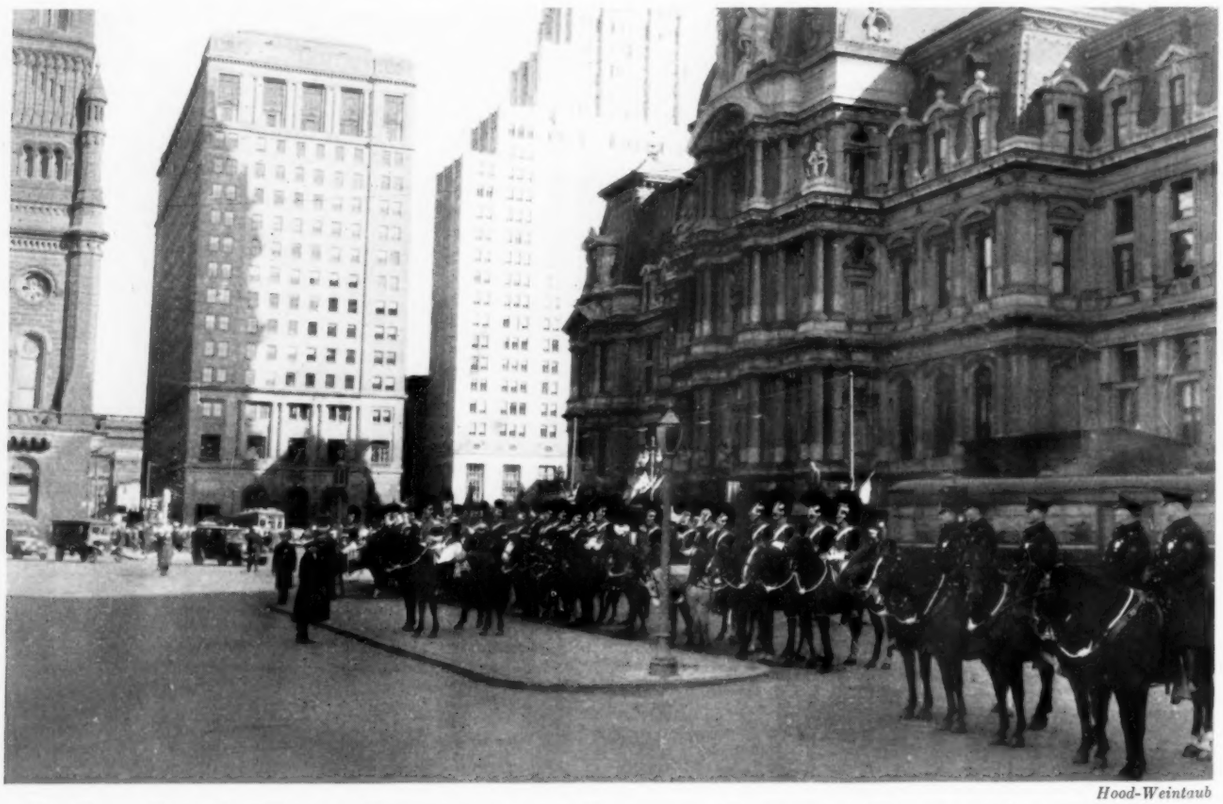
Ordnance Day in Philadelphia



Hood-Weintaub

ORDNANCE VEHICLES ON DISPLAY IN REYBURN PLAZA, MARCH 26, 1935, PRIOR TO INSPECTION BY THE SECRETARY OF WAR.



Hood-Weintaub

THE FAMED FIRST CITY TROOP OF PHILADELPHIA, WHICH ESCORTED THE SECRETARY OF WAR AND HIS PARTY DURING THE OBSERVANCE OF THE ORDNANCE DISTRICT BIRTHDAY.

Band who were to play suitable music during the inspection. This was where the day's best incident took place. Picture Major Murray, G-2 of the 79th Division, explaining to the band leader just why he should not, as soon as the official party arrived, play "Anchors Aweigh"!

Spread out in front of the speakers' stand was quite an impressive display, a miniature Aberdeen Proving Ground Show. In the center foreground were the four scout cars, manned by troopers of the 3rd Cavalry from Fort Myer, an armored car, and a half-track truck. Off to the left was one of the Disston tractor-tanks of the type recently designed and manufactured for export. Also on this side were exhibits of fire-control equipment and one of the modern high speed 75-mm. field guns together with a 75-mm. howitzer, a brand-new Ordnance development. The right hand side of the exhibit was given over to a 3-inch antiaircraft gun and a sound locator. In the center background was the mobile shop equipment of an Infantry division. The big trucks were completely equipped with lathes, drill presses and welding tools, set up and in operation. The Raritan Arsenal not only furnished the trucks but sent along a display of machine guns, rifles, and small arms to show how actual repair work could be done in the field. Lording it over the entire display by reason of its voice and not its great size was a Signal Corps public address system truck.

Hood-Weintaub

THE ARMY SALUTES ITS CHIEF.

Secretary Dern, Arriving at Railroad Station, with Col. U. S. Grant, 3rd, U. S. Army.

As the Secretary's car drew up and he alighted, the bugler of the Troop gave the prescribed four flourishes. Here the Secretary was joined by Rear Admiral William C. Watts, Commandant of the Fourth Naval District and his Staff. The entire party then took seats in the speakers' stand where Mr. Gadsden assumed charge and introduced the Hon. J. Hampton Moore, Mayor of Philadelphia, who officially welcomed the Secretary to the city.

Following the Mayor's greeting the Secretary made a brief talk pointing out that the display of motorized equipment was merely for the purpose of showing the advance which had been made in the design of ordnance material and not because of any recent international developments.

At the conclusion of these short speeches the official party left the speakers' stand to make a detailed inspection of all of the equipment. Naturally there was a full quota of press and newsreel photographers on hand and the Secretary was called upon to make frequent poses, the only thing the photographers missed having him do was actually use the welding tools on the repair trucks. Just to make the inspection complete one of the local radio stations set up their microphones on the Plaza and broadcasted a "play by play" description of the proceedings. To make the broadcast more realistic to those listening in, several of the Ordnance Officers present stepped up to the "mike" and gave complete word pictures of the equipment. This same plan was carried out a little later in the afternoon when the Secretary had left the exhibition. The crowd which had gathered to watch the proceedings was a great deal larger than anticipated, so large in fact that it was impractical to allow them to make their own personal inspection of the pieces. Rather than disappoint any of the civilians who had come out to learn something about this special equipment, the officers in charge of the display repeated their descriptive talks over the Signal Corps public address system. In this way several thousand people were able to get a clear, intelligent idea of the purpose and design of all of the various types of material displayed. There was the added advantage of saving time making it possible to get the trucks and cars moved away from the Plaza and off the busy streets before the five o'clock rush of traffic started.

When the Secretary had finished his inspection the entire official party was taken to the armory of the First City Troop. There Captain Crawford C. Madeira showed his guests the historical relics of the Troop, including the letter written by George Washington at the close of the Revolution thanking the Troop for their help and advising them that they were then free to return to their homes after valiant service.

PROMPTLY at seven o'clock the high light of the day's celebration got under way at the Bellevue-Stratford Hotel. Here the Philadelphia Post of the Army Ordnance Association and the Chamber of Commerce gave jointly a testimonial dinner to Secretary Dern. The main ballroom of the hotel was entirely filled with tables set up for the occasion and in response to the invitations sent out several hundred guests were present. The majority of these men were connected with the industries of Philadelphia. These are the men who will have to carry the burden of producing the necessary ordnance material should the United States become involved in another war.

A stage runs across one end of the ballroom and for this dinner it was occupied by the band from the Valley Forge Military Academy. The boys had voluntarily given up a few days of their spring vacation in order to play during the dinner. Everyone present agreed that they did a fine piece of work. In fact the Secretary, at the start of his address, publicly complimented them.

The entire face of the balcony running around three sides of the ballroom had been decorated by a detail from the Quartermaster Depot. Using the designating flags of the various branches of the service they made an effective and at the same time not too elaborate display.

Mr. Gadsden served as the toastmaster for the dinner.

Seated with him at the speakers' table were high officials of the Army and Navy and men prominent in business and official life. As the main address of the evening was scheduled to go on the air at nine thirty, timing of the dinner was an essential point. It was served promptly and as almost everyone had had a busy afternoon, it was eaten with equal gusto.

The first speaker to be introduced was Major General William H. Tschappat, Chief of Ordnance, U. S. Army, who paid the Army's tribute to Mr. John C. Jones for his splendid work in organizing the Philadelphia District. The General pointed out in his speech the tremendous amount of responsibility which Mr. Jones had carried in getting the District started in 1918 and in coördinating the efforts of the multitude of industrial plants which were working upon government contracts at that time. He concluded his remarks by presenting Mr. Jones with a scroll designed especially for the occasion, reading in part:

"On this, the observance of the seventeenth anniversary of the establishment of the Philadelphia Ordnance District, we extend to Mr. John C. Jones congratulations and thanks for his patriotic service as former Chief of the District.

"His tenure of office, begun during the World War and continued for many years thereafter, was marked by high leadership, unselfish purpose and eminent success in the interest of the United States."

In responding to the General's tribute, Mr. Jones pointed out that a great deal of his work as Chief of the District was not so much making the contracts as it was getting out of them at the end of the hostilities, with equal fairness to the contractors and the Government.

The President of the Chamber of Commerce, Mr. William F. James then paid the City's tribute to Mr. Jones and as a token of the City's appreciation of his services presented him with a cast of the District's emblem made up in the form of a plaque.

Following Mr. James, the toastmaster introduced Mayor Moore who made a most interesting presentation of how much the present day activities of the Army mean to Philadelphia. The Mayor pointed out that the Quartermaster Depot with its large civilian personnel and Frankford Arsenal are providing work for a great number of men who would probably be out of work if they had been employed by many of the large manufacturing plants which have been forced to cut down their payrolls considerably.

Another routine job of the Army, concerning which very little fuss is made, is the harbor and river dredging work of the U. S. Engineers. The work done by this Corps enables Philadelphia to continue its boast of having the finest fresh-water harbor on the Atlantic Coast. The Mayor expressed his official appreciation of the assistance to the City which is rendered by the Army and wished the Secretary all possible success in his Cabinet post and in the expansion of those activities.

Brigadier General Herman W. Schull, Assistant Chief of Ordnance, U. S. Army, was the next speaker; his address, in part, follows:

"It is a great pleasure to be here this evening at this delightful dinner given by the Philadelphia Post of the Army Ordnance Association and the Chamber of Commerce of Philadelphia in honor of the seventeenth anniversary of the establishment of the Philadelphia Ordnance District, to meet so many members of this organization with whom I was associated during the war, and also your distinguished guests. I am sure I express the feelings of all present when I say that we greatly appreciate the kindness and hospitality of our Toastmaster, Mr. Gadsden, the District Chief, the Mayor of Philadelphia, the Chamber of Commerce of Philadelphia, and Major Maxwell and the personnel of the Army and Navy for all they have done for our pleasure and entertainment today.

"The Ordnance Department of the Army acknowledges a continuing debt of gratitude to the Army Ordnance Association in the knowledge that this great patriotic organization can be depended upon at all times to extend its aid in the furtherance of all measures planned by the Army to carry out its proper mission of providing for the National Defense.

"The Ordnance Department, as we all know, is that branch of the army that is concerned primarily with the design, development and procurement of Ordnance weapons, comprising such articles as rifles, machine guns, cannon with their carriages, tanks, combat cars, bombs, ammunition and similar articles. The list comprises in all about 1,200 separate items and some 250,000 components of various kinds. Many of these articles are, of course, non-commercial in character and for many of them there are no commercial equivalents in common use. . . .

"The experience of the World War taught us, among many other things, that the production and supply of Ordnance weapons in quantities sufficient for a great war presents probably by far the most difficult and complicated phase of the entire problem of army supply. Articles such as rifles, machine guns, cannon, tanks, and other weapons can not be obtained in great quantities in any country, no matter how diversified its industrial development, or how wealthy it may be, except after a long period of intensive preparation in which to provide the means to manufacture them, or unless reserves sufficient to tide over this period of preparation have been built up and maintained in time of peace. It is not an exaggeration to say that the rate at which Ordnance weapons can be manufactured and supplied to the armies in the field imposes a practical limit on the military effort that any country can exert in war under modern conditions. . . ."

Promptly at nine-thirty the Secretary was introduced. It is not necessary to quote or make comments on his speech here as it is the leading article in this issue. One fact which should be stated, is that with one exception, the press in their editorials the day after the celebration, gave very fine reactions and enthusiastic comments on the Secretary's address.

Without doubt the celebration was effective. It did much toward making the people of Philadelphia "ordnance conscious." It gave the manufacturers a chance to see the actual material they would be called upon to produce. It made thinking people realize that the display was for educational purposes and not a sabre-rattling gesture because of recent overseas developments.

From such activities as the one described here, comes that greatly desired reaction of national pride which is more than ever needed in this country today. The Philadelphia Post can roll down its sleeves and look back on its seventeenth birthday party with a great deal of satisfaction in the knowledge that it was a good job well done. Perhaps other Districts or Reserve Organizations could follow this example and demonstrate the importance of Ordnance preparedness.

Europe Looks at Chemical Warfare

Some Expert Views on the How and Why of Gas

By Alden H. Waitt*

WHEN a weapon has played an important part in one war, it follows that its probable role in a future war becomes a very vital matter to all military establishments. That the armies of the world are greatly concerned with the question of what form chemical warfare will take is evidenced by the vast amount of literature being published on the subject, especially in Europe where the possibility of war appears to be a livelier topic than it is in America.

The effectiveness of chemical warfare was completely demonstrated during the World War and it is generally accepted by military writers that the chemical weapon has come to stay. It is essential then that we know as much as possible about the direction in which the evolution of chemical warfare is tending.

We can look back to the World War for some indication. The experience that we have gained since the war by our study and research gives us further guidance in making our estimate for the future. During the war years, however, chemical warfare developed too rapidly, changes took place in too short a space of time to prove completely the value or lack of value of certain means and methods, and opportunity to test out developments thoroughly was lacking. Further, the close of the war prevented the testing of some important developments that came to fruition just before the end. Again, conditions of stabilized warfare existed until the last few months and relatively little experience was gained as to the tactical employment of chemicals in a war of movement.

If we base our estimate of the future on our own research and post-war experience alone there is danger that our point of view will be too narrow and we are likely to be biased by preconceived ideas.

It seems best then to examine the work being done with the new arm by possible allies or enemies. An indication of what foreign armies are doing, together with the experience accumulated during and since the war, and our present research will enable a satisfactory prediction as to the main lines along which chemical warfare will develop tactically if not technically. A knowledge of foreign tactical doctrines on the employment of chemicals and protection against them is of great importance to officers of the arms.

The first question that occurs to anyone is "What gases will be used in the future?" No one can answer this question positively. Foreign writers agree that at least for the first few months of any war, should one occur within a few years, the gases that were known at the end of the World War would be used. Of these, the opinion is unanimous that mustard gas would be the principal agent and the most valuable. Opinion in the United States coincides with this.

C.W.S. Photo

CHEMICALS IN THE INFANTRY ATTACK.

OCCASIONALLY a statement appears in the newspapers that a new gas has been discovered superior to any previously known. Such statements make good copy, but not one of them has ever been verified. Today no gases are known that are superior to those known during the World War. It is unlikely that information about a new gas will be obtained until it is used in war. The chemical agent is too well adapted to secrecy. The only insurance against surprise by a new gas is painstaking research to find for ourselves every chemical agent that offers promise for offensive or defensive uses. It seems fairly safe to say that today mustard gas is still the king of warfare chemicals and to base our tactical schemes on that agent as a type.

Major Paul Murphy, formerly director of experiments of the Chemical Defense Experimental Station, Porton, England, in an article in the *Army, Navy and Air Force Gazette*, February 1, 1934, says of mustard gas, "Of the many chemical substances discovered during the war to have value for military purposes, the most striking was . . . . mustard gas. So rapid was its advance as a weapon that the supply figures towards the end of the war show clearly that it was rapidly overtaking even high explosive as a charging for artillery shell and other projectiles. Moreover, unlike the other 'gases' it was never adequately countered by the defense. Add to this that subsequent research has shown *far more effective methods of*

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employing it and is still unable to provide a wholly effective defense against it and its potentiality for military purposes will be apparent to all." He ascribes the power of mustard gas to its well-known "triple physiological effect" in that it attacks eyes, skin, and lungs, and its "dual physical properties" in that it is effective both in the liquid and vapor state. By skillful use these qualities make possible a number of variable effects. For example, the persistence of mustard gas may be varied according to the manner in which it is employed. By persistence is meant the length of time the effect of the agent endures after it has been disseminated; the Germans call it the period of effectiveness.

Major Murphy might have gone even further in his claims for mustard gas. The importance of the properties he mentioned is tremendous, for the action of a persistent chemical and, in fact nearly any chemical agent, can be controlled to an extent that is not possible with other weapons. The chemical can be made to endure over short or long periods, can be regulated to cause mild or severe casualties, and can be fired upon targets which are not occupied at the time by personnel. These are qualities in addition to the ability to shoot around corners not possessed by thrusting weapons.

International

Gas Proof Shelter in Paris.

So far as weapons for projecting chemicals are concerned, the major development is the use of chemicals from airplanes. Air-chemical attack is recognized by most military writers as one of the important factors to be reckoned with in the future. All first-class powers and most of the smaller nations are studying the possibilities of this new weapon and making their preparations against it.

In the Soviet Union the chemical and air arms are very closely related. Not only are detailed accounts of the various methods of air-chemical attack included in military publications, but the two arms are coupled in the civilian organization, the *Osoaviakhim,* or League for Air and Chemical Defense, which is said to include over 15 million of the citizens—men, women, and children.

Commandant Y. M. Fishman, Chief of the Military Chemical Administration, in *Military Chemistry,* a guide for the commanding personnel of the Red Army, published in Moscow in 1930, says, "There is no doubt that in connection with the air arm the use of chemical agents will play a very important role in the next war." This work is of especial interest since it is the only published statement that exists today covering the complete tactical doctrine on chemical warfare of a major power.

For the chemical attack from the air, Commander Fishman lists the following technical means: chemical bombs, smoke bombs, incendiary bombs, appliances for producing smoke screens, and appliances for contaminating the surface of the ground.

Chemical bombs, he states, may be charged with both persistent and non-persistent gases, although he finds little value for the non-persistent agent tactically. Smoke bombs containing solid fillings, such as phosphorus or liquids like stannic chloride, are intended for producing smoke screens for "auxiliary purposes when serving the troops, and for cover against the fire of the antiaircraft batteries." Incendiary bombs charged with thermite or other incendiary material "are intended for bombing buildings, stores and structures, as well as for igniting crops, woods and camouflage coverings."

He describes two appliances for forming smoke curtains from airplanes. One depends upon ejecting the smoke liquid by pressure from the tail of the plane. The other consists in introducing either solid or liquid materials into the exhaust of the motor. The statement is made that at the present time it is possible to make curtains of sufficient density one kilometer long by 200 meters wide. Airplane appliances for contaminating the surface of the ground with persistent agents such as mustard gas are similar to those for producing smoke screens. A heavy contamination over a wide area is claimed for this method.

The Red Army lays great stress on the value of persistent gases dropped from airplanes, a method of attack which is simple, easily accomplished, and productive of important military results. Chemical aviation is assigned three principal missions—to cause casualties, to interfere with movement of troops, and to disorganize supply activities in rear areas. More and more attention is being given to the last two missions in all foreign armies.

The first mission is accomplished by direct attack on troop concentrations with persistent spray or bombs. The Russian text notes that the spray is likely to be more effective for this mission than bombs and that the targets will generally be found somewhat to the rear and rarely in forward areas. Movement is embarrassed by placing persistent gas along routes of march, in defiles, or on ground the opponent must cross. Supply is interfered with and the third mission accomplished by dropping persistent gas on railroad junctions, supply depots, munitions and power plants. The delaying action of mustard gas is emphasized; movement is slowed down because protective equipment must be worn by everyone working in or passing through a contaminated area.

The Red Army has issued the most comprehensive instructions on the use of the air-chemical arm, but the subject has not been neglected in other armies. The Italian "Instructions on Defense Against the Combat Chemicals," issued in May, 1930, at Rome, state: "Aviation will certainly be employed with great frequency, ... especially against troops in masses, columns in march, and reserves, ... The combat chemical may be sprayed in the form of drops from an airplane flying at low altitude, rendering untenable or impassable sections of the country which have been laid out in reference to the plan of attack or defense that the enemy intends to develop."

The Italians have a conception of air-chemical attack similar

to that of the Russians. They divide it into two forms—direct attack on marching troops, and "preventative" attack—that is, contaminating the ground. They also foresee wide use against installations in the rear of the armies. The direct attack on troop columns is accomplished "by throwing bombs or sprinkling the combat chemicals, generally of the persistent type, discharged from above in the form of minute drops." The "preventative" attack is accomplished "by the same means, dropping bombs or spraying the ground through which the enemy believes that the marching unit will have to pass." Detailed instructions are given as to the proper action to be taken if attacked by chemicals from the air.

Although Germany has been debarred by the Treaty of Versailles from the manufacture and employment of warfare chemicals and has been limited in her development of military aircraft, this has not prevented study and discussion of these modern methods. Many excellent treatises have been published on the subject by German military and civilian experts. One of the most complete, conservative, and accurate books on chemical warfare is *Der Chemische Krieg,* by Rudolph Hanslian. In discussing the relative value of chemicals projected by artillery and aircraft Dr. Hanslian makes the following statement: "The extraordinary superiority of the airplane as compared with the gun as a means of transporting poison gases lies especially in the fact that the airplane is able to bring the poison combat substances to the target in a much more favorable weight ratio to casing. . . . The ratio of the contents of gas combat substance to the total weight of the shell is about 1 to 8; for the airplane bomb 1 to 2. Much more favorable for the airplane does this figure become with the spray method from tank containers . . . in which case there is no projectile casing." Again he says, in referring to the use of gas in the initial phases of a war, "In this primary state of open warfare, if the air forces are approximately equal, the following will have to be counted on by both sides: chemical attacks from the air against roads of approach, stations, troop billets, ammunition parks, wharves, industrial establishments, and also perhaps against hinterland cities."

Hanslian goes back to the original reason for the first gas attack in advancing the theory that gas will be valuable for bringing about open warfare after a period of stabilization. He suggests that the releasing movement can be executed from the air by driving a deep wedge many kilometers wide into the enemy's front with mustard gas.

THE distinguished soldier, General Von Seeckt, organizer and Commander-in-Chief of the post-war German Army, in "Thoughts of a Soldier," 1930, comments on the potentialities of air attack "especially when coupled with gas."

Another German view is that expressed by Dr. Ulrich Mueller in *Die Chemische Waffe Im Weltkrieg Und Jetzt,* published at Kiel in 1932. He suggests that besides mustard gas a persistent tear gas, such as brombenzylcyanide (CA), be used to force masking and hence cause delay since only one-tenth as much CA would be required as in the case of mustard gas. Thus one airplane could cover an area ten times as great. The final mission of the air arm, Dr. Mueller says, "will be embodied in its effect on the enemy's hinterland, especially on the cities."

In France many books and pamphlets have been published on air-chemical warfare, but most of them confine discussion to the attack on the civil population. That France is awake to the possibility of her cities being attacked with chemicals from the air is certain. Experiments have been carried out over several French cities in which gas situations have been simulated. An account in *La France Militaire* for September 2, 1931, states that simulated attacks on Nancy, August 26 to August 29, 1931, included a bombardment with toxic gases and incendiary bombs to give training in defense. M. Riché, a member of the French Chamber of Deputies, is quoted in a press report as stating to the Chamber in August, 1930, "In spite of Article 171, Treaty of Versailles, in spite of protocols and conventions solemnly signed, as long as total disarmament is not effectively assured, the major arm of the aërial assailant will be chemicals."

In England, Major General J. F. C. Fuller, a leading exponent of modern methods in warfare, has laid stress on the

International

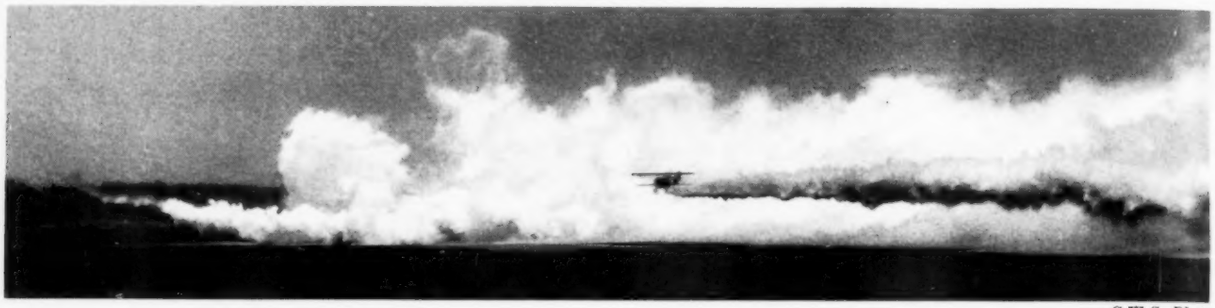
RESCUE WORKERS IN A PARIS GAS SHELTER.

value of the aero-chemical arm. In "War and Western Civilization," London, 1932, he asserts, "If gas is the weapon of future warfare . . . the aeroplane is its natural vehicle." And again, "The main military weapon of attack will, I consider, be gas, not because it is so deadly, but because it is so terrifying." His many writings emphasize the moral effect of gas and he has made much of the use from airplanes of non-toxic agents, presumably the tear gases and irritant smokes, and of mustard gas which causes many casualties but few deaths.

In an earlier work, "The Reformation of War," London, 1923, General Fuller says, "Let us picture again the infantry toiling along the road. The aeroplanes approach; they do not skim a hundred feet above the road, but fly at an altitude well outside effective bullet range. They open their chemical tanks and a fine spray and fog envelopes the astonished column of men." His conclusion that "traditional infantry will have no place on the battlefield" in face of such attack will not be accepted by many, but his suggestion as to the possibilities of this form of attack should provide thought.

Major Paul Murphy, in an article "Aerial Gas Attack," which appeared in the *Army, Navy, and Air Force Gazette,* February 8, 1934, visualizes aërial attack with mustard gas "as the most potent and probable development of chemical warfare in the immediate future."

The British "Tactical Notes on Defense Against Gas," August, 1934, discuss two forms of chemical spray attack, one the low-flying attack, already described, the second, spraying from a height and at a distance out of sight and hearing of those at the target. Although careful training will be



C.W.S. Photo

A Smoke Screen on Land.

necessary to assure hitting a small target under such conditions, it should be effective against large targets such as a long column of troops. Serious thought must be given to the drifting of chemicals from a distance. If practicable it will provide a tremendously effective weapon against which protection will be well-nigh impossible.

Of almost equal importance with the use of chemicals from the air, and so far as tactics is concerned, of perhaps greater significance, is the attention being given by European armies to the use of persistent vesicant agents for creating artificial barriers. The Russians and Italians especially devote considerable space in their texts to the various methods for what they term the infecting of localities, or soil contamination, and to the means of protection against such forms of attack.

Mustard gas or any of the persistent agents, the effects of which persist on the ground for several hours or days, is particularly adapted to this purpose. Fishman, in *Military Chemistry,* describes in great detail the methods of infecting a locality with agents such as mustard gas or lewisite. He says, "The essence of infecting a locality consists in spraying and throwing on the surface of the ground the persistent poisons, especially those of vesicant action, in consequence of which sections of the locality are made very dangerous for the troops that are there . . . The property of the vesicant agents which consists in working through ordinary clothing and shoes, makes it impossible to remain in the poisoned sections unless provided with masks and special costumes; even if these latter might be technically and economically available in large quantities for the troops, they would occasion enormous inconvenience in movement and would cripple the fighting qualities of the men."

There is a certain disadvantage in the use of mustard gas since it acts slowly. Consequently, even unprotected troops may pass through a mustard area if it is absolutely necessary, and perhaps accomplish a mission before the agent takes effect. The losses of a large proportion of the personnel will be serious, however, a few hours later. There is the further disadvantage of denying the part of the line infected to one's own troops, a fact which makes necessary a careful decision by the commander who is employing the chemical. Commandant Fishman suggests that "in case persistent poisons are used which work quicker than mustard, passage through an infected section without protective means is rendered impossible." In this connection it is interesting to note that lewisite, a persistent vesicant arsenic compound developed by our own Chemical Warfare Service just before the close of the World War, is a severe irritant and is much quicker in its action than mustard gas. Further, this particular agent has been given much attention by the Russians.

In describing the methods of infecting a locality, Fishman states that it may be accomplished by "artillery chemical shells, chemical mines, and chemical air bombs charged with persistent poisons, also by means of special sprayers for the persistent poisons, ground appliances, or on airplanes."

The French Gas Defense Regulations prescribe "infection" fire (*les tirs d'infection*) for artillery firing mustard gas shells on terrain already occupied or expected to be occupied by the enemy. Interdiction fire (*les tirs d'interdiction*) with gases of immediate effect, such as tear gas, lewisite, or mustard gas mixed with tear gas, is prescribed to prevent the enemy from entering parts of the terrain and for delaying effect.

The methods suggested for creating mustard gas barriers by aircraft already have been referred to. Fishman and other writers do not emphasize the use of the spray method for the purpose, but appear to lay stress on the use of bombs containing persistent chemicals. Hanslian in an article quoted in *La France Militaire,* October 31, 1926, suggests using containers of thin metal or of glass with the weight of gas proportionately great.

Although foreign literature contains many references to the use of aircraft to create mustard gas barriers, and not so much concerning the value of artillery, I believe that within its range artillery will prove more effective for this purpose.

U. S. Air Corps Photo

Smoke Bombs and Wind Dispersion.

C.W.S. Photo

A SMOKE SCREEN AT SEA.

Not only can better accuracy of fire be attained with the artillery arm, but it is also possible, especially with the 75-mm. gun, to get a better distribution of chemical on the target. Thus, for an equal amount of chemical a better dissemination will result from firing a large number of 75-mm. shells than would be obtained by firing a smaller number of shells of larger caliber or bombs of greater size.

Both Italian and Russian texts describe in detail special sprayers or "ground appliances" for placing mustard gas on the ground which may be carried by one man or be put on a cart or on an automobile. The agent is thrown out of the sprayer by compressed air or by special pumps similar to insecticide sprayers. The most favorable conditions for infecting a locality by this means are "a dry and close soil, absence of rain, and moderate temperature."

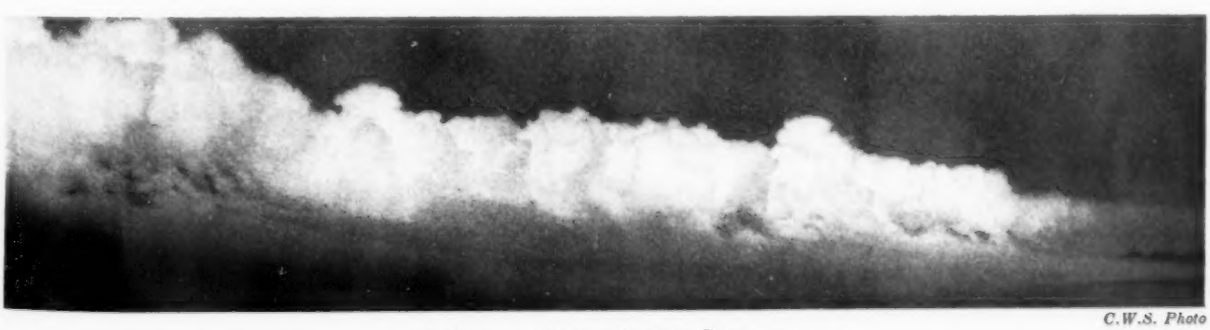
The Italian text outlines four methods of creating mustard gas zones. The first is called terrestrial spraying, using hand or vehicle devices, and is employed for zones just in advance of the front lines. The next is called "mustard poisoning by fire" and is accomplished by the artillery generally of small or medium caliber. It is used for infecting ground at some distance from friendly troops, and which the enemy must traverse. The third method is "aërial spraying" by planes flying at low altitudes and is used to the rear of the enemy as well as near one's own front. The fourth method is by "aërial bombardment" with mustard bombs. It is intended for deep in the rear of the enemy. The important thing to note here, however, is the effect that these zones of persistent chemical will have on maneuver and the movement of troops in the future. It is probable that in many battles of the future it will first be necessary to overcome gas obstacles before it will be possible to attack. Zones of persistent gas easily may be laid in front of important defensive positions. It should be much simpler than laying barbed wire, although it is not suggested that it would take the place of wire. Such gas obstructions should be well covered with rifle and machine gun fire so that troops approaching will be kept to the ground.

These gas obstacles thus introduce another hazard which the commander must overcome, and a greater premium is placed on reconnaissance, always of prime importance. Complications in the time factor are certain when gas is encountered.

The use of mustard gas to deny areas is one of the most important reasons for a highly developed protective system, a system which will include the best possible equipment and highest type of training in both technical and tactical protective methods. That this is recognized by the Russian, Italian, French, British, and German armies is evidenced by the detailed instructions on protection that are given in their texts.

THE exact role of chemical warfare in the future is not yet completely defined. That it has come to be recognized as a normal weapon is, however, definitely established. The shouting and tumult over miraculous possibilities of the new arm have finally died away and we find the nations accepting the chemical as a logical, useful, and necessary weapon. This is important since if nations are to be prepared against war, they must, in view of the rapid development of the chemical arm, be prepared against chemical warfare. While recognizing the limitations of gas they must not lose sight of the great potentialities of this weapon which is universal in that it applies to all arms. A discussion as to which is superior, high explosive or gas, should not cause military men to forget that together they form a perfect team.

The late Dr. Haber, who introduced modern chemical warfare, is quoted by Rudolph Hanslian as assuming a cautious attitude when he wrote, "The experiences of the war are in favor of gas ammunition and against the exclusive use of high explosive ammunition." And Hanslian himself sums up the matter sanely in the statement, "Perhaps the actual facts of the future role most nearly may be approached by stating that 'In a future war the chemical arm will not be *the* principal arm, but *a* principal arm.' This would well indicate the importance of this method of warfare for the soldier."



C.W.S. Photo

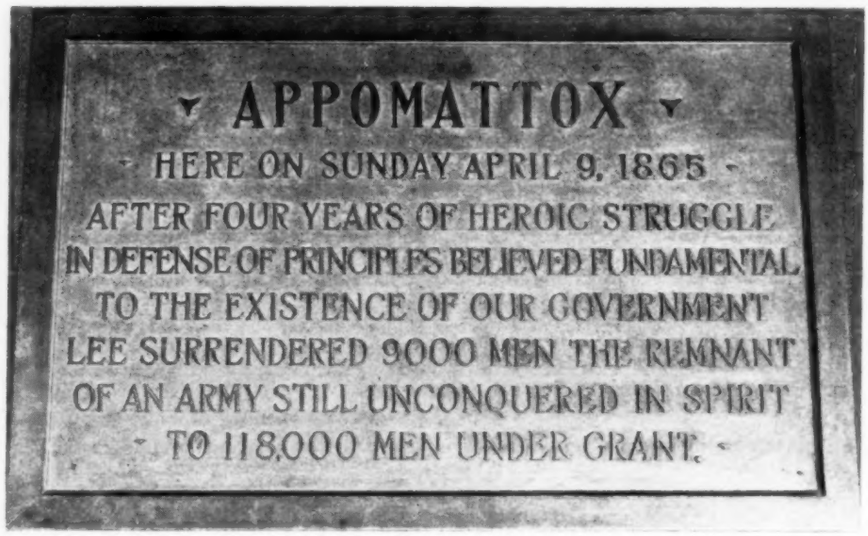
A STUDY IN SMOKE SCREEN DENSITY.

Appomattox

"You Will Then See Cause To Thank God For Much"

By LeRoy Hodges*

ON top of a low rolling rise above the brook-like headwaters of the river that bears its name, in a smiling, sun-kissed country, are the neglected, age-stained ruins of Old Appomattox. Beyond, nearer the sunset, in a small iron-railed plot, nineteen white marble headstones stand through the years in a north-south row facing the dawn. Eleven of these weathered badges of supreme sacrifice are marked "Unknown." One stands at the head of the grave of a Confederate officer, another designates the grave of a non-commissioned officer of the Confederacy, and the other six stand sentinel over the final resting places of soldiers who wore the Grey.


APPOMATTOX
HERE ON SUNDAY APRIL 9, 1865
AFTER FOUR YEARS OF HEROIC STRUGGLE
IN DEFENSE OF PRINCIPLES BELIEVED FUNDAMENTAL
TO THE EXISTENCE OF OUR GOVERNMENT
LEE SURRENDERED 9000 MEN THE REMNANT
OF AN ARMY STILL UNCONQUERED IN SPIRIT
TO 118,000 MEN UNDER GRANT.

Inscription on Bronze-capped Granite Marker in Old Court House Circle at Appomattox.

At the head of this row of low tombstones, on the right of the line, farthest South, is the only one that guards a Union grave—"U. S. A. Unknown." Next to it, stands one inscribed "C. S. A. Unknown."

On this lonely hill, under the sun in the day and beneath the stars at night, in the bosom of the Mother State, these two stones, side by side, symbolize the "Spirit of Appomattox." Here together lie the earthly remains of two Unknown sons of the same great nation, champions of conflicting principles, soldiers of opposing armies—brothers united in death; one shrouded in Blue and the other in Grey.

With high ideals, superb courage, and unsurpassed devotion, these two dared the Great Adventure, and now rest together through the years sharing the last long sleep. "U. S. A. Unknown" and "C. S. A. Unknown"—monuments of the service and sacrifice of the North and South, badges of secession and union, tokens of strife and peace, and reminders of life and death. This is Appomattox—the End and the new Beginning.

Here in this open low-railed, sky-roofed Valhalla, on the hill at Appomattox, these simple tomb-slabs contain the names of eight heroes of the South who, through the endless night, face the light of the day beyond with their ten Unknown comrades and their Unknown Brother from the North. These are the names: Captain Miles C. Mocan, Fayette Artillery, Virginia; Sergeant O. F. De Mesme, Donalsonville Artillery, Louisiana; J. W. Ashby, 2nd Virginia Cavalry; J. W. Douglas, C. S. A.; A. B. Hicks, Company D, 26th Virginia Regiment; J. A. Hogan, Company E, 26th Georgia Regiment; J. H. Hutchins, Company A, 5th Alabama Battalion; P. F. M. Winn, Battery E, 9th Georgia Regiment.

A modern highway pierces the center of the deserted village; divides, and circles a small tree-shaded plot where the county court house formerly stood. The approach to this highway—encircled spot from the river below is flanked on the left by the old county jail. On the right are what remains of the old tavern. Desolate buildings stand in decay on each side of the road at the western gateway. Just beyond, between the village and the Confederate cemetery, on the left, in a grove of trees, are the ruins of the surrender house.

In the circle in the heart of the village is a cast-iron marker stating that "On this spot stood the Old Court House of Appomattox County, Virginia, erected 1846. Destroyed by fire 1892."

AT the western end of the circle is a bronze-capped granite marker inscribed: "Appomattox: Here on Sunday, April 9, 1865, after four years of heroic struggle in defense of principles believed fundamental to the existence of our government, Lee surrendered 9,000 men, the remnant of an Army still unconquered in spirit, to 118,000 men under Grant."

After the fall of Petersburg on April 2, 1865, and the evacuation of Richmond that night, the Confederate forces under General Robert Edward Lee retreated westward. On the sixth of April, greatly outnumbered, they suffered severe losses at Sailor's Creek, a small tributary of the Appomattox River about fifty miles west of Petersburg, but, fighting fiercely all along the way, hungry and without food, continued their retreat westward towards Lynchburg and the security of the mountains. General Lee reached Appomattox Court House

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on the eighth of April. Union cavalry had already swept around to the front of his retreating army, and a halt was necessary. In a council of war that night, General Lee and his officers decided to cut their way through the encircling Union lines, and to the corps commanded by General John B. Gordon was assigned this task.

With the exception of Pickett's charge at Gettysburg, there is no record of a more hopeless movement in all the precedent-shattering annals of the War Between the States. On Sunday morning, the ninth of April, Gordon launched his attack and broke through the first of the Union lines, and was, as he said, fighting his troops to a "frazzle," when General Lee, finally realizing the utter futility of continued resistence, ordered a truce. In this last fighting at Appomattox, April 8-9, the Union losses were about 200 men killed and wounded, and the Confederate losses estimated at 500 killed and wounded.

ABOVE: *The Confederate Cemetery at Appomattox.* RIGHT: *Tombstones at Appomattox that mark the graves of two unknown soldiers of the War Between the States.*

On April the seventh, Lieutenant General U. S. Grant, the commander of the Union forces, had sent General Lee a request to surrender to avoid further unnecessary bloodshed. Lee made reply inquiring as to the terms of surrender. The next morning, General Grant replied specifying the terms, which Lee promptly rejected. Following the truce on April ninth, however, a meeting at Appomattox was immediately arranged between the two commanders on the basis of the letters already exchanged.

General Grant and his staff came into Appomattox, and met General Lee, who was attended by only one member of his staff, at the home of Major Wilmer McLean, a substantial brick house, where the terms of the surrender of the Army of Northern Virginia were written by General Grant and accepted by General Lee. The terms of the surrender and their acceptance were embodied in two letters which were written, signed and exchanged in the McLean house on that memorable Sunday afternoon.

More than 40 years ago, in 1893, the McLean house was torn down with a view to its removal and reerection elsewhere. For some reason, this plan was never carried out, and today this historic place is a tumbled, vine-choked mass of crumbling bricks—a wayside ruin on the Field of Appomattox.

These events at Appomattox on April 9, 1865, have been characterized by a beloved and able son of the North "as the most creditable episode in all American history—an episode without a blemish, imposing, dignified, simple, heroic." Continuing, Charles Francis Adams said:

"Two men met that day, representative of American civilization, the whole world looking on. The two were Grant and Lee—types each. Both rose, and rose unconsciously, to the full height of the occasion—and than that occasion there has been none greater. About it, and them, there was no theatrical display, no self-consciousness, no effort at effect. A great crisis was to be met; and they met that crisis as great countrymen should. Consider the possibilities; think for a moment of what that day might have been; you will then see cause to thank God for much."

While the old village of Appomattox has been allowed to fall into decay, the battlefield area has been marked in a simple way here and there at important points. A tablet marks the site of the McLean house. The spot where General Lee read his farewell order to the Army of Northern Virginia is marked, as are the places where General Grant and General Lee had their respective headquarters. The place where the Confederate soldiers stacked their arms and received their paroles is designated, as is the point from which the last artillery shot was fired. Other interesting places are similarly marked; and on this field stands the North Carolina "First at Bethel—Farthest at Gettysburg—Last at Appomattox" monument.

By joint resolution, The General Assembly of Virginia on March 6, 1934, memorialized The Congress to establish a national park at Appomattox. The legislature expressed the desire that the historic grounds and points of interest at Old Appomattox Court House be suitably marked, restored and preserved, and stated that this could best be accomplished by making the area a national park.

Bills have been introduced in The Congress in accordance with these recommendations of The General Assembly. With support from both the North and the South, this enabling legislation could be enacted. The Appomattox National Memorial Park would then take its place among the battlefield parks of the nation as a shrine for the inspiration and guidance of living Americans as well as for the instruction of the many generations of our fellow-countrymen yet unborn.

ARMY ORDNANCE

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Month by Month

THE fourteen civilian industrial executives who serve as chiefs of the Ordnance Procurement Districts have many brilliant patriotic rosettes on their respective lapels. Not only do they give leadership to the munitions preparedness problem and help solve, along commercial lines, the industrial complexities of ordnance production in time of emergency but, in addition to many other commendable characteristics, they have the somewhat unusual attribute of perseverance and length of service. In most cases the gentlemen who are rendering this important public service as Chiefs of Districts have been doing so for years—a majority of them since they first undertook the assignment when the decentralized procurement system was adopted in the midst of the World War. Our Republic is fortunate that it is so. Changes in personnel of this industrial staff are infrequent and the few that have occurred serve to emphasize the high character of the men and the work.

Ordnance in Chicago

So when one of our district chiefs relinquishes the office some appraisal of the individual and his record befits the occasion. On March 12th Mr. Edmund A. Russell retired as chief of the Chicago Ordnance District and his successor, Mr. Frederick A. Preston, was inducted into office. The ceremony is described elsewhere in these columns (page 300). Mr. Russell had been at the helm of the Ordnance ship of state in the Chicago area since early in 1918. He brought to the great responsibilities of his war assignment an industrial experience which was invaluable. Like the other men selected by the late Gen. Guy E. Tripp, father of the Ordnance district system, and approved by General Williams, our distinguished war-time Chief of Ordnance, Mr. Russell had every capability and capacity for directing the transformation of industry from a peace to a war footing. This he did with unusual distinction and to a degree which enabled the Chicago Ordnance District under his guidance to perform its allotted task with promptness and efficiency. During the seventeen years since then Mr. Russell has continued to serve as district chief directing the industrial mobilization plans for Ordnance as they affect the Chicago industrial area. Now that he has retired from this active assignment—happily, however, to continue on as chairman of the district's Advisory Board—the sentiments expressed by the Chief of Ordnance upon the occasion of his retirement meet with the hearty accord and express the feeling of all who are acquainted with his unobtrusive but most effective service.

The new chief of the Chicago Ordnance District is Mr. Frederick A. Preston who assumed the leadership of the district when Mr. Russell relinquished it. On behalf of the several thousand individuals who comprise the Army Ordnance Association we bid Mr. Preston hearty welcome. He brings to an office already made distinguished by his predecessor a standing and experience which will enable it to continue successfully in its high purpose. For those of his fellow ordnance crusaders who may not be acquainted with him we present this brief biographical sketch:

Mr. Preston was born at Evansville, Ind., March 10, 1884. He attended the Muncie High School, Indiana, studied at Phillips Academy, Andover, Mass., and received his Ph. B. degree from Yale in 1906. Since then he has been connected continuously with the railway supply industry. He became a vice-president and director of the P. and M. Company in 1910; vice-president and director of Poor and Company, 1928; vice-president and director, Canton Forge and Axle Company, Vermillion Malleable Iron Company and a director of the Rail Joint Company, Stefco Steel Company and the Congress Trust and Savings Bank.

Mr. Preston was commissioned captain in the Air Service October, 1917, and promoted to major July of the following year. He served overseas in the supply section of the Air Service from October, 1917, to December, 1918, during a part of which time he was the chief of the Materials Division of that organization. His clubs include Chicago, University, Yale, Onwentsia and Shore Acres. He is also vice-president of the Community Fund of Chicago, president of the board of the Ridge Farm Preventorium and a director of the Chicago Council Boy Scouts of America. Every success to the new Chief of the Chicago Ordnance District.

THE title of this editorial note is really a misnomer because what was the Army Bill, providing for the needs of our military forces for the fiscal year 1936, is now an accomplished act. While many of us may differ as to the propriety and effectiveness of some present-day legislation, none but the unrealistic opponent of sane national preparedness will be averse to the plans adopted for our Army during the coming year. The Administration displayed splendid judgment in its recommendations and the Congress by its whole-hearted approval negotiated itself into a position where it has made amends for many crack-brained legislative proposals now before it. In the House, Mr. Tilman B. Parks of Arkansas, chairman of the War Department Sub-Committee of the Appropriations Committee for the majority party, and Mr. Chester C. Bolton of Ohio for the minority, their colleagues on the Sub-Committee, the Committee as a whole and the House of Repre-

The Army Bill

sentatives are to be commended for the spirit with which the legislation was approached and finally enacted. Likewise the Senate, under the skilful handling of Senator Royal S. Copeland of New York, ably demonstrated that the vast majority of its members do not share the vociferous demagogery of which some members of the body are frequently accused.

A general rebuilding of our Army is provided for in this legislation. Personnel is to be restored by 46,250 (Regular Army) and 5,000 (National Guard) enlisted men and the officer component eventually will be enlarged through additional appointments to the Military Academy. Ample funds are provided for technical and tactical organizations to an extent that the Ordnance Department has quite a job cut out for itself during the coming year in supplying needed equipment. In none of this is there any element of expansion much less rearmament, and far less warlike purpose. The plain truth of the matter is that for years the Army has been whittled away in men and materials; everything else but national defense appeared to be "socially beneficial." This policy has left an impression that the then Army and its then equipment were ample and that replacement or rebuilding was never required. Hence the complaint that larger appropriations are a saber-rattling gesture is a very childish attitude on its very face.

This point was well emphasized by Mr. Bolton during the debate on the bill in the House of Representatives. As the bill then stood, the total appropriation provided was $378,000,000, of which $60,000,000 was for non-military purposes. The total was an increase of $49,000,000 over the preceding year. Mr. Bolton's analysis is very much to the point and we repeat it here as an example of sound reasoning and very good Americanism:

"Unfortunately, the general impression given by a War Department appropriation bill is that the entire sum carried in the bill is to be used for military activities. This, of course, is not correct.

"But I believe the greatest asset against war is preparedness. I believe our expenditures by the War Department for the Army are the best insurance against war that we can have. In that connection I want to give you some figures as to the expenditures for insurance in this country.

"During the past 5 years—and I get these figures from the standard fire-insurance tables—during the last five years ending December 1933 we spent $4,502,992,000 for premiums for fire insurance in the United States alone. That is an average of $900,598,000 per annum. If we can afford to pay that for just one type of insurance against fire, is $318,000,000 annual expenditure for national preparedness on the part of our Army excessive? I do not think so, and I think when we compare these expenditures with other insurance expenditures we can agree that this expenditure is the best way to insure peace.

"Statements have been made comparing the personnel of the United States Army with other nations of the world. I do not want to take up the time of the committee, but I do desire at this point to call attention to certain tables, comparing the strength of the United States Army with other nations of the world on the basis of per capita, wealth, and so forth, which I believe may correct certain impressions.

"The principal reason for high relative costs in the Army of the United States as compared to foreign nations involves fundamental differences in principles of organization. Every foreign army of any size, except that of Great Britain, is recruited and maintained by conscription. Military service in those countries is rendered in peace as an obligation to the state, and pay involved is insignificant. As illustrations, these conscripts are paid as follows: In France, seven and one-half francs per month; in Italy, twelve lira per month. Expressed in terms of American money, these amounts are, at normal rates of exchange: For France, thirty cents per month; for Italy, sixty cents per month.

"In contradiction to the conscript method of recruiting and maintaining armies, the American establishment is purely voluntary. As a consequence, pay must be sufficient to induce men of the necessary qualifications to enlist in the Army. Admittedly this system is an expensive one, but it nevertheless represents a principle in military organization that has been consistently observed in this country as a peace-time policy since the founding of our Republic. The mere fact that it entails a greater expenditure has never been considered as sufficient reason for its abandonment by the United States.

"Another and very important reason for higher per capita costs in the United States is our national standard of living. American labor, American citizenry as a whole, enjoys a standard of living far higher than that obtaining in any other country. This is reflected in higher domestic prices for a piece of steel, a pound of powder, an airplane engine, a uniform, and for every item in the vast congeries of articles that constitute the essential supplies of the Army.

"There is given below in tabulated form certain statistical data concerning comparative costs in military establishments of the world. These figures have been determined with such accuracy as was possible in the time available:

National defense expenditures, as compared to national wealth, for the year 1933 are as follows (Army, Navy, and Air):

	Estimated national wealth	Defense expenditures	Percentage
United States	$241,300,000,000	$650,149,600	0.26
United Kingdom	121,663,000,000	580,085,404	.48
France	58,200,000,000	594,115,227	1.02
Italy	25,000,000,000	327,787,191	1.30
Japan	51,000,000,000	424,769,158	.85
Union of Soviet Socialist Republics	73,000,000,000	806,000,000	1.09

National defense expenditures (Army, Navy, and Air), in 1933, in proportion to population:

	Population	Amount	Per capita
United States	127,971,113	$650,149,600	$5.08
United Kingdom	[46,189,445	580,085,404	12.56
France	41,928,851	594,115,227	14.17
Italy	44,482,109	327,787,191	7.37
Japan	64,450,000	424,769,158	6.59
Union of Soviet Socialist Republics	165,700,000	806,000,000	4.86

Percentage of total governmental expenditures devoted to national defense (Army, Navy, and Air) for following years:

	United States	United Kingdom	France	Italy	Japan
1927	16.05	13.86	18.32	22.26	27.46
1928	16.83	13.73	20.65	21.90	24.20
1929	16.92	13.59	21.55	21.43	26.82
1930	17.13	13.58	17.63	22.61	28.41
1933	13.42	17.08	29.42	30.21	36.90

Due to the differences in costs of the voluntary system as opposed to the conscript system, and to differences in living standards, it is extremely difficult to base any accurate comparisons on budgetary considerations. The following tables make military comparisons on a somewhat different basis:

Soldiers per 1,000 population, 1933 (mother countries only)

	Population	Active army (including active air force)		Active army and reserve (including air force)	
		Strength	Per 1,000 population	Strength	Per 1,000 population
United States	127,971,113	113,365	0.89	419,740	3.28
United Kingdom	46,189,445	230,894	5.00	529,708	11.47
France	41,928,851	477,003	11.37	6,809,043	162.39
Italy	42,000,000	442,291	10.53	6,470,208	154.05
Japan	64,450,000	143,100	2.22	2,205,100	34.21
Union of Soviet Socialist Republics	165,700,000	841,400	5.08	16,005,000	96.59

Approximate number of soldiers per billion dollars of national wealth (mother countries only, 1934)

	Wealth in billions	Aggregate number of soldiers in army, including reserves (National Guard and Officers' Reserve Corps both included in United States figures)	Soldiers per billion
United States	247	419,740	1,697
United Kingdom	121	471,615	3,876
France	58	6,809,043	116,994
Italy	25	6,470,208	258,808
Japan	51	2,205,100	43,223
Union of Soviet Socialist Republics	73	16,005,000	217,046

President Roosevelt in signing the measure issued the following explanatory statement:

"1. The bill authorizes the increase of the average enlisted strength of the Army from 118,750 to 165,000 enlisted men. In a very real sense this increase does not represent an extension of the Army involving new units. It is more correct to say that the increase is in effect a restoration to company, troop, battery and other units of privates who, in previous sessions of Congress were arbitrarily transferred and the units thus decreased in order to organize various new corps and units such as the Air Corps.

"2. There are two strengths of the fundamental units in the Army—peace strength and war strength. War strength fixed by tactical requirements of combat averages 250 enlisted men per company, troop or battery. Peace strength, fixed by the necessity for efficient training and for reasonable readiness, should average 120 enlisted men. In recent years, however, this peace strength average has been whittled away until it now barely averages 70 enlisted men per company, troop or battery. This law restores to these basic units their peace-time strength. In the great majority of Army posts barracks were originally constructed for peace-time strengths so that quarters are already available."

A Noble Trio

IN closing the current record of three ordnance leaders whose passing was chronicled in the last issue of Army Ordnance, it is fitting that we include in these columns a notice of the action taken by the officers and directors of the Army Ordnance Association at their annual meeting in New York City last month. The board had before it official notice of the death of three of its members, Col. William C. Spruance, Pliny E. Holt and Ralph M. Dravo, who for many years had always participated in its deliberations. The following minutes were read, adopted and spread upon the records of the board:

"William Corbit Spruance—Charter member, first life member, donor of the Spruance Endowment and Association medalist, Colonel Spruance was tireless in promoting the interest and objectives of the organization. Supplementing his distinguished service to industry through a lifetime of professional enterprise and his patriotic zeal through distinguished service as an officer of the Ordnance Department of the United States Army during the World War, he was among the first to realize the importance of an organization such as ours. For the past fifteen years he was a leader in our cause whose counsel, advice and assistance were always valuable. His death has removed from our midst an associate and friend whose record in the annals of the national defense of our country stands preëminent."

"Pliny E. Holt—Charter member, president of its California Post and renowned engineer, Mr. Holt's services to our Board and our organization were of untold value for many years. His interest in ordnance preparedness arose from his service to the Ordnance Department of the United States Army during the World War when he was a pioneer in the design and development of self-propelled track vehicles for military purposes. His World War record in this field is recorded with affection and gratitude in the annals of American industrial achievement. In the years following the war his interest continued unabated and his coöperation was extended most liberally both to the national defense services of our country and to our organization. We acknowledge our deep sense of appreciation of the high service of our late colleague whose loss to our organization is indeed great."

"Ralph M. Dravo—Charter member, president of its Pittsburgh Post and former chief of the Pittsburgh Ordnance District who for fifteen years had served with distinction on our board, Mr. Dravo was a man of unusual talents as attested by the success and high esteem which came to him in his personal and professional enterprises. Our organization and the Army were most fortunate in being among the objects of his concern. His loyalty to the cause to which our organization is dedicated was expressed on many occasions and whatever progress industrial preparedness in the United States has achieved is due in no small measure to his active participation in it. In his passing we are deprived of a dear friendship, our organization has lost one of its valiant promoters."

Thus the record. In a more lasting way will the kindly characters and the intense patriotism of this noble trio remain in the affections of their associates.

Science-Fiction and War

A CERTAIN official, high in the crime-suppression service, boasts that he never reads gangster-stories. Maybe he is missing something. Sometime we wonder whether the ordnance experts ever read the fantastic accounts of future wars, written by authors of science-fiction. If not, then they *are* missing something. For example:

Recently the newspapers have been filled with items about two outstanding developments of considerable import in case of war, namely: (1) Germany's diesel-powered airplanes, perfected because diesel engines are immune to the ignition-stopping radio ray, supposed to have been developed by France and England; and (2) the radio-controlled robot plane. Something new? Not at all!

Way back in July, 1932, a science-fiction yarn, "The Radio

War," by Ralph Milne Farley (*nom de plume* of a distinguished member of the Army Ordnance Association) in *The Argosy* magazine, told all about a war in which the United States will be engaged in the year 2000. In that story, the American air forces used diesel planes to escape the effect of the ignition-stopping ray of the enemy; in fact, Mr. Farley wrote, way back in 1926, about ignition-stopping rays and diesel planes in an *Argosy* novel of adventure on the planet Venus. And in his more recent novel, above referred to, he not only had robot planes guided by radio waves, but also made these radio waves non-interferable. By adding television, he enabled the fliers to conduct their air-fights from an easy-chair in an underground bomb-proof.

Mr. Farley's war of the year 2000 also involved the use of: a searing electric arc at the intersection to radio beams; aërial torpedos, dirigible by radio; five-inch guns, with recoil absorbers, mounted on airplanes; devices on warships to catch and explode enemy torpedos, before they reach their mark; and, conversely, a double-explosion torpedo, to reach its mark even after being caught; ultra-violet and infra-red searchlights; sound-ranging apparatus, which detects, with the speed of light, the sound of airplanes; cities guarded from air-attack by aërial mine-fields; a curtain of sound, through which no bullets can pass; latitude and longitude beams, for the guidance of air-traffic; scores more of similar inventions; and finally a return to the old Springfield rifle, as being superior to all these modern (i.e. A. D. 2000) contraptions.

Two of Farley's ideas have already come to pass. We wonder how soon the rest will. Not very soon, unless ordnance experts make a practice of frequently dipping into science-fiction for relaxation.

THE PRINCETON PLAN

RECENT press dispatches describe a modification in R. O. T. C. training at Princeton University which impresses us as commendable. Two new courses have been added to the R. O. T. C. curriculum; one on international relations, the other on civic and military law. The purpose is to draw the Department of Military Science of the University into closer association with the other departments. Here is a suggested solution of one problem of military training at a liberal arts college. The problem has been emphasized time and again by alleged pacifists and others who say that a strictly technical course in military science is out of place in the arts curriculum. The experiment has as its purpose "a fuller, broader and better rounded type of instruction" for aligning the Princeton R. O. T. C. course with the other fields of study at the University. The change was in no way a move to placate any undergraduate organization of an anti-war nature nor was it "to please the *Daily Princetonian*, campus newspaper, which never misses an opportunity to speak out against the Department of Military Science."

The Princeton experiment is a logical and effective step. It may be the first in a worth while modification of R. O. T. C. training which will establish these courses on firmer ground, less subject to the attack of the student league objectors. R. O. T. C. courses are accepted by colleges no doubt as a patriotic duty. In return the War Department offers an additional content something on a par with other college courses in a technical school. However, at an institution devoted entirely or mainly to liberal arts there is question whether the appropriateness of the content of the present military science course carries equal weight with other requirements toward the degree of Bachelor of Arts. The point is no doubt well taken and the feeling seems to be increasing at many institutions of this nature.

The War Department program of instruction states "The general object of the courses of instruction of the Reserve Officer's Training Corps is primarily to qualify students for positions of leadership in time of national emergency and, secondarily, to provide the nation with an electorate informed of the purpose and necessity for a sane policy of national defense and of the weaknesses in our present system."

The secondary objective is an important one. To attain this in the fullest degree requires some understanding of relations between nations and particularly of the relations between our own nation and others. This subject is almost universally accepted as a proper theme of university investigation and study. Therefore it would seem to be the ideal subject for the combination of military value and higher educational value. However, it is a subject which can be effectively handled by very few Army officers. A background is necessary of a kind which most of them do not have. For this reason the course at Princeton will be given principally by members of the Department of Politics with the Department of Military Science assisting. It would be fatal to attempt such a course without instructors trained in that line. The course to be given is not a "course in peace" as it was largely publicized. It will take up a study of international relations in general, diplomatic methods, machinery in the form of treaties, pacts, the League of Nations, etc., present relations between European nations, American foreign policies and relations with other nations. Methods of maintaining peace are obviously included in such a study.

PHILADELPHIA PICKETS

THE popular pastime of picketing is not half bad. When the Philadelphia Post of the Army Ordnance Association last month conducted its historic meeting and arranged for a display of Army equipment opposite the City Hall, the occasion was utilized by pickets for distributing handbills. An airplane soared overhead releasing bundles of similar pamphlets. Later, while the Secretary of War was addressing the mammoth meeting at the Bellevue-Stratford Hotel, pickets paraded in front of the hostelry bearing sandwich-man signs with such statements as "2 + 2 = 4, gun + gun = war." Altogether this friendly opposition only increased general interest in the real purpose of the meeting.

The psychology of picketing is curious. At best it is aimed at an *ex parte* statement of the picket's case. When the fad is resorted to by those who call themselves pacifists as against those who favor national defense this form of agitation is ridiculous. There is not a picket for peace anywhere in the land who detests war more ardently than members of the Army Ordnance Association. What the pickets purposely overlook is the soundness of preparedness. If the Philadelphia pickets are blamed for their misrepresentation they are also to be thanked for stimulating added interest in and popular approval of adequate preparedness for national defense.

What About War Losses?

An Editorial

THERE is a great deal of feverish talk these days about war profits. Some of it is sensible; much of it is obviously insincere and silly; little of it pays any attention to the possibilities and probabilities of war losses. Free-lance writers have come to the front in the guise of experts in the field. Being versed in crowd psychology they realize that the time is ripe for crack-brained panaceas. Result: we are having ourselves talked blue in the face about profits—individual and group profits in time of war.

To the reader of headlines the question naturally comes, we hope, "But what about war losses"? After all, profit is a relative term, it must be considered in comparison with its opposite, the idea of loss. Sight means nothing unless discussed in terms of blindness. Light is not fully comprehensible unless the meaning of darkness is known. With profits we must consider loss; to neglect the one to the exclusion of the other, in war or in peace, is sheer nonsense.

Some of our people—the ducks as well as the drakes—are being misled by the quack; mud-slinging has deliberately fouled the waters of the pond, the flock dawdles about profit as though there were no such thing as loss. Yet war, the very notion of the word, *is bound up in profit and loss*—profit, of course, else war as a national policy would never be resorted to, loss else every war would terminate with everybody victorious and nobody vanquished. But the rule is the same in peace or war: you can't have your cake and eat it!

CORRECT indeed is the view that the time has come to take inordinate personal profits out of war. Sincere students of the problem knew the time came on November 11, 1918, and they have been working on it conscientiously, seriously and solidly ever since. These studies came to fruition five years ago when the War Policies Commission, devoid of demagogery, arrived at a sane program. Since then self-seeking individuals have attempted to capitalize the problem by citing figures, generally of their own compilation, and in doing so have brought public opinion to the verge of what may be the prize blunder of our blundering national defense career. We will have blundered seriously if we overlook or, what is worse, if we deliberately misrepresent the *loss* of war which is a far greater catastrophe than any individual or collective inordinate personal *profit* could ever be.

The profit pundit has a deft faculty of playing his aria on the profit string alone, he dare not let his bow touch the loss string and for good reason—his faulty instrumentation would disclose to an unsuspecting audience that the possibility of individual profit is the minor key, that the possibility of national loss is the major. Simply stated the proposition is this: If we ever have another war (which God forbid) will we win it or lose it? Will we have made plans to utilize every fiber of our national being for victory or will we have circumscribed ourselves with inane laws sure to bring defeat? Will we have developed among ourselves a policy of fairness and equality of burden, collective advancement of the common defense being uppermost, or will we by steps adopted now utilize another major war as the opportune time for changing our economic order? These are questions which must be faced candidly and without fear or favor. However we face them and whatever we see in the answers to them, the price of taking the profit out of all war in the abstract must not be the price of losing any war in the concrete. He who dwells upon the profit of victory and the methods of achieving it has only half a brain if he forgets or leads others to forget that much more important thing—the loss that comes with defeat. Some political demagogs, radical writers, intellectually malnourished professors, muddle-headed ministers—all secure in their own peace-time and war-time profits—have become belligerent to the point of ferocity in damning the munitions maker whom they accuse of inordinate profit and are leading a jittery people to forget the far more important thing—the losses of a lost war.

This is not to be marveled at because the people of the United States as a people have never experienced the losses of a lost war. The South did in 1865! There is profound truth in Will Rogers' witticism, "We have never lost a war nor won a peace conference." It seems that we have developed an attitude of mind that we *cannot* lose a war. We have had our fingers burned seriously often enough, we have bungled through time and again. As Mr. Dern, Secretary of War has said, "It is lucky that we have been so lucky." We place such reliance on "getting the breaks" that confidence of victory has become a habit. We have forgotten how seriously close we have come to defeat.

SURELY it is not the function of this Journal to pass judgment on questions about which only trained, practical, experienced economists and statesmen are qualified to speak. About such questions of fundamental economics and statescraft as fair or unfair return on capital or individual effort, the effectiveness or ineffectiveness of any tax program, our opinion is worth no more than that of the agrarian politician whose experience is agricultural and not industrial, or of the journalist whose only experience is that of criticizing destructively on the basis of hindsight and offering little constructive on the basis of foresight. "Pay-as-you-fight" sounds to us like a most desirable program—if there is time enough between skirmishes when the fight is on to figure the tax rate. Indeed "pay-as-you-go" is a thoroughly sound policy in peace as well as in war. For our part we would much prefer that we pay as we go *now*, privately and publicly, and not wait for the next war to begin to do so. For centuries thrifty, conscientious people have preached and practiced the pay-as-you-go policy. The few of them who are left today still believe in the process whether it concerns public relief, public works, private comfort or private enterprise. The "experts" who now say they would fight the next war on the pay-as-you-go plan do well by stressing a rule of conduct which many of our people have discarded. Their words would be taken far more seriously, however, if they favored pay-as-you-go at all times. Some of the loudest spokesmen for the pay-as-you-fight plan in war are not asking for pay-as-you-fight in the present "war on depression."

During recent weeks two plans for taking the profit out of war have held the attention of the country. One, which bears the name of Congressman McSwain, chairman of the Committee on Military Affairs of the House of Representatives;

the other, which bears the name of Mr. John T. Flynn, whose qualifications as an experienced economist on problems of modern warfare we do not know. Not much has been said about another plan suggested years back, that of the War Policies Commission, which had no political or radical connections whatever. The McSwain plan embodied in a bill has passed the House of Representatives. The Flynn plan was presented to and more or less sponsored by the Senate Committee investigating the munitions industry. Analyzing both plans, Mr. Walter Lippmann in the *New York Herald Tribune* wrote, "Using somewhat different devices the two bills are yet essentially the same, for both propose to make war unprofitable by giving the Government absolute power over the whole economic life of the country. Both propose to suspend completely the operation of the law of supply and demand for goods and for salaries, wages, interest, and to substitute for it a universal conscription of property and person. Neither bill says this quite so bluntly as I have put it but nevertheless it is, I believe, an accurate description of both bills."

Commenting on these and War Policies Commission recommendations, Mr. Arthur Krock, writing in the *New York Times,* presents this analysis:

"For sixteen years Mr. (Bernard Mannes) Baruch made numerous speeches and wrote numerous articles on the subject, and every year he lectured before the War College. The War Department with the lack of plans in 1917 in mind, drew up a formula. Last year the Senate committee to investigate the methods of munitions makers began its investigations, which immediately impinged upon the broad base of a general war-making machine. After the investigation had gone on a while, the President appointed Mr. Baruch, General Hugh S. Johnson, General Douglas MacArthur, the Army Chief of Staff, and five Cabinet members as his commission to make a report on mobilization for war.

"Immediately the subject came to the forefront in Washington, and Representative McSwain, who has been thinking for years about "taking the profit out of war," summoned his House committee to formulate a plan. It is this plan, in the form of the murky McSwain bill, which has just passed the House, and now goes to the Senate for clarification and a good deal of recasting to bring it more into conformity with the Nye bill. That bill is the product of the researches of the Senate committee and of a radical economic theory.

"Both bills reflect the political passion of the time, which is to attempt to achieve radical reforms while legislating on substantive measures. The New Deal blew the pitch, and almost every bill before Congress is a mixture of cure and tonic. The purpose of the authors of the effort to mobilize the 'three M's' and take the profit out of war was to prepare, for immediate execution when the time came, a plan whereby war could be conducted with utmost efficiency, at the least expense, at the least reasonable profit to individuals and at the smallest cost of life. In their present form both the McSwain and the Nye bills have gone far beyond that purpose."

IN detail the War Policies Commission proposals with which War Department plans are coördinated are not unmindful of the losses of a lost war. These proposals have been frequently discussed in these pages.

In this connection we share wholeheartedly the opinion of the War Department so ably expressed before the Senate Committee by Lieut. Col. C. T. Harris, Jr., Ord. Dept., Chief, Planning Branch, Office of the Assistant Secretary of War. Speaking in the name of the Secretary of War and representing the considered judgment of the Department and of industrialists who have coöperated with it for years, Colonel Harris said:

"For fifteen years, in compliance with a mandate from Congress, the War Department, in coöperation with the Navy Department, has been engaged in the preparation of plans for the mobilization of industry in war. The two main objectives of these plans have been the assurance of an adequate supply of munitions and the prevention of profiteering. It seems appropriate to state that primarily the object in war is to gain a complete and quick victory. The welfare of the country certainly demands that nothing be permitted to stand in the way of this paramount objective. The full productive effort of the country will be required to achieve this end. In a modern war not only the armed forces but the whole nation, with all its resources, are engaged in the effort. The maintenance of the national morale demands that all elements of the population shall be treated with equal fairness and justice, and hence it seems highly important that profit be limited if not eliminated in war. Nevertheless, this worthy undertaking must not be allowed to assume any form that will hamper, cripple or destroy the more vital thing of producing the necessary war materials when they are needed. The preservation of the country must come first.

"The six basic elements in the Industrial Mobilization Plans prepared by the War and Navy Departments are Government regulation of industry, price fixing, priorities, licensing, commandeering and excess profits taxes. It is noted that these same six essentials form the basis of the Bill proposed by your Committee. The War Department believes that all are necessary and that if properly administered they will accomplish the purpose intended.

"I am not prepared to enter into a technical discussion of the taxing provisions of the Bill. The War Department believes that a rigid excess profits tax is necessary in war, but this matter is primarily one for the Congress and the Treasury Department. May I, however, inject this word of caution: Tax rates should not be placed so high that they will restrict the production of essential war materials. While the War Department is not prepared to express a fixed opinion as to whether or not the rates proposed in the Bill are unduly restrictive, the provision for a maximum annual profit of three per cent appears open to question as not constituting a fair return.

"In closing, I wish to stress the deep interest of the War Department in any fair, reasonable and effective movement which will minimize profits in war. The three essentials of war are men, money and munitions. Victory cannot be achieved without a plentiful supply of each. I must, therefore, in the name of the Secretary of War, again warn that any measures adopted must not be so restrictive or binding in character as to prevent necessary production, since any failure to produce munitions when needed may be paid for, not in dollars and cents, but in human lives and the consequences of possible defeat."

Possible defeat! There is the essence of the problem about which the professional reformer says nothing. Possible defeat! There is the element of loss which cannot be dissociated from the element of profit. Possible defeat! There is the great unknown to be measured in terms of intangible principles about which other generations of Americans were much

concerned—liberty, freedom, justice. Sad to say, we of this generation are content to have the issue confused, and by making the so-called munitions maker the scapegoat we have built up for ourselves a perfectly silly, misleading attitude about the industrialist whose forge and retort must produce the sinews of war.

No finer historical analysis of this fallacy has come to our attention than the editorial comment of the *Chicago Tribune* published in its issue of February 10, 1935, under the title "American Wars and Munition Makers." We believe that our readers will share our admiration for the sane logic herein presented and we take the liberty of republishing it in full not only with credit but with sincere congratulation to the *Tribune:*

"Among the callers at Washington's headquarters after he had taken command of the Yankees besieging Boston were two French salesmen, MM. Penet and Pliarne. They had come over to sell powder. The general wanted many things and was beginning to despair of getting any of them in time, but what he wanted most of all was powder. The New England powder barrel was so low that when Washington discovered that because of an error in stock taking he did not have the little he thought he had, he feared he could not make any defense against even a brisk sortie.

"He couldn't place an order and the salesmen moved on to Philadelphia to see what could be done with the Continental Congress. A secret committee ordered 500 tons and Penet sailed to France with the contract, starting the flow of supplies which from then on, through the connivance and secret aid of the French and Spanish governments, flowed to America to keep the rebellion going.

"Skepticism and pacifism may still regard the rebellion as a bad war. The alternative and its consequences are forever obscure and all that can be said for it, subject to controversy, is that it gave a people the liberty they said they wanted; that, for good or bad, it established for the first time a constitutional representative democracy with political equality, and that it preceded, if it did not cause, a rattling of chains and a shaking off of shackles in Europe. It also freed the British people from autocratic personal government which again had asserted its ascendancy at home.

"The causes of the colonial willingness to fight rather than endure are fairly well known. The people were not stimulated by the munition makers and in all the train of events which led the Yankee armies to pen General Gage and his regulars up in Boston there is no train of powder. Munition makers were sadly lacking and a gunsmith was literally worth his weight in gold. The most perilous danger the revolutionaries faced was their lack of anything to fight with when they put themselves in the position of rebels. They even resorted to spears and tried bows.

"The new nation's next dangerous war, disregarding a private naval one with France, was again with Great Britain. After many years of submitting to indignities on sea and land, the American republic went to war, picking the wrong time to do so and waiting until Great Britain was temporarily free of all other enemies. The injuries and indignities suffered before this step was taken must be regarded as quite intolerable. And again in the train of events which led a provoked nation to fight for its security and its rights there is no train of powder.

"The American predicament was not then as hopeless as it had seemed in '75 and '76, but Mr. Jefferson's peaceful administration, which preferred embargoes to battleships, had provided no fleet which Mr. Madison could use and no army on which he could rely. America again went to war in its shirt sleeves, busted financially and scrambling for men, muskets, cannon, and all the supplies which would extricate it from the position into which it had been forced. Again the munition maker, disregarded in times of peace, nowhere around when war was declared, was the one person most needed by a distracted country.

"America, coming out of this war, had only minor disturbances until Texas presented itself at the door of the Union as a republic asking admission. The war with Mexico which came in the wake of that has been denounced by altruists as unconscionable. We doubt the truth of the charges. However discredited manifest destiny may seem in these days, it was not improbable that events were inexorable in shaping themselves as they did to take the boundary of the United States down to the Rio Grande. At least the critic of this development would have a difficult time in finding the influence of a munition maker among the causes. He could find the slave owner, the politician, the land seeker, etc., but he won't find the provocative agent of the munition manufacturer.

"In 1861 the North determined to save the Union. Again the federal agents went hurrying to the far corners of the earth trying to get equipment for an army the nation did not have, buying discarded firearms and war supplies wherever they could be found. The American predicament again was the familiar one of being in a deadly struggle and of having entered it without preparation. And again the munition makers, of whom there then were some, including the du Ponts, were being stimulated to hurry their products to a desperate front line which had been thrown out with no thought of its supplies. A generation of people and their statesmen had tried to avoid that war and in all the pros and cons and all the bitterness and attempts at conciliation the influence of the munition maker is undetectable because it was not there.

"After peace, industrial America took its great strides ahead. The parts of the continent were joined together and the nation became a giant, but one which again threw its armor on the scrap heap, dissolved its armies, and allowed its navy to grow ancient and rot. Just in time it repented of its naval folly and built the white squadron, augmenting it later with other modern ironclads, so that the next time the country went to war it was not wholly powerless at sea, although it had no army. There were critics of the war with Spain, but in the minds of the American people there was no doubt that they fought to put an end to inhuman conditions in Cuba which were a reproach to the neighboring United States and challenged its humanity.

"The war was to free an oppressed people and it could not have received popular support if it had not been, and if the results do not at times seem to square with the expectations that is not the fault of the optimism which guided the purpose of the American people. The munition maker did not plunge the American people into that war. Again governments had tried to avoid it and popular sentiment insisted upon it. No subsequent commercial or financial maneuvers or intrigues can distort the original high purpose influencing the event.

"Then the World War and America's reluctant entry into it. Historians disagree and motives and causes are com-

plicated. The radical says Wilson was carried in to protect capitalistic investments. One historian will see that America could not endure what would follow the triumph of a German military autocracy. Another will find the predominant cause in American failure to preserve an absolute neutrality. Still another may be convinced that violence to our neutrality on the seas, the disregard for the rights of our noncombatants, the destruction of our property, the killing of our citizens, the contemptuous disregard of our protests, would have forced any nation to arms, and that inasmuch as the German aggressions were the most frightful the natural course for the nation was to ally itself with the side whose success would be the most advantageous and thus bring the whole evil to an end.

"The final judgment and decision was that of Woodrow Wilson. Even his critics absolve him of being influenced by the munition makers. He decided that the United States could no longer remain a neutral observer and that the future of the country required the sacrifice. The person who finds the maker of war supplies the dictator of this event is simply satisfying himself with the discovery of a personal devil. He believes in demonology. It is to be noted again that the United States, in spite of all the warnings it had, again went to war without the men or equipment to fight it.

"The doctrine of war profiteering now advanced as an explanation of American wars is historically wrong *in toto*. It is wholly false, without a justification in the entire annals of the American people. It ignores every fact in the events preceding every conflict in which the republic has engaged and its harmfulness does not end with the distorted attribution of motives to past generations but begins with its deluding of people as to the causes of wars.

"If peoples and governments are to assume that wars are caused by influences which have had nothing to do with them, they will be ill-prepared to face future complications which might be better met if the truth about them were conceded. The isolation of a particular demon whose malignancy causes people to do suicidal things will merely distract attention from real causes which need to be perceived and understood if their potential force is to be controlled."

OUR latest experience—the World War—is replete with losses. Although not a lost war, bungling politicians at least converted it into a lost peace. Consider our losses in flesh and blood—losses that might have been cut in two if we had been prepared for the task. American combat divisions, according to Colonel Leonard P. Ayres, were in battle 200 days from April 25, 1918, during which time they were engaged in 13 major operations of which 11 were joint enterprises with the French, British and Italians and 2 were distinctly American. They advanced, on all fronts, a total of 485 miles, nearly all of it against desperate enemy resistance. They captured 63,000 prisoners, 1,378 pieces of artillery, 708 trench mortars, 9,650 machine guns. In June and July, 1918, they helped to shatter the enemy advance on Paris and to turn retreat into a triumphant offensive. At St. Mihiel they pinched off in a day an enemy salient which had been a constant menace to the French line for four years. In the Argonne and on the Meuse they carried lines which the enemy was determined to hold at any cost. They cut the enemy lines of communication and supply for half the western battle front. In the great Meuse-Argonne offensive they used 1,200,000 troops in 47 days of battle, employing 2,417 guns in the attack. But here alone the losses were 120,000 casualties! In all 256,000 battle casualties—"a heavy price when counted in terms of the individuals who gave their lives or suffered from wounds, a small price when compared with the enormous price paid by the nations at whose sides they fought." Of every 100 American soldiers and sailors who took part in the World War 2 were killed or died of disease during the period of hostilities. Except possibly for the Crimean War this was the bloodiest war ever fought. There were 50,300 battle deaths for us, 205,690 wounded. Here indeed were losses! But, the student is blind who reads into that record a holocaust of the arms maker's making! The irony of the charge—the deceit of it!

These were losses beyond calculation and they might have been multiplied by ten had not the force "without stint or limit" of mobilized America undertaken its task. For some of the losses blame the obstructionist who, being sufficient unto himself, closed his eyes to need for preparedness. For the profits that came from uncontrolled inflation and enriched the farmer, the cotton planter, the wheat grower, the wholesaler, the retailer, the munitions maker, blame the same group. They were then loudest in talk and weakest in common sense. The one thing they could not see then and will not see now is that sane preparedness—planning for men, money and munitions, with fairness and justice to all—against war is the surest guarantee of peace.

THE question for decision by the American people today on this subject of war profits is one of tremendous concern. It is not going to be solved properly until all the facts are evaluated and all the conclusions are drawn. The approach to it by sensational charges of war profits and extreme measures of preventing them takes into consideration not half of the whole question. Need we repeat what has been said in these columns time and time again, year in and year out, that effective war planning demands the elimination of all inordinate profits—for labor as well as capital, for goods as well as services, for rich as well as poor? But towering over and above all these are the losses of a lost war. In our cocksureness we conveniently overlook the possibilities of loss. As long as we continue to do so we flaunt the experience of centuries. Yet we are willing to be led by *ex parte* statements as to fact and radical pronouncements as to theory. Having confused the effects, war profits, for causes and having magnified the mote to the proportions of a beam, we will, in all probability, and in accordance with a good old American custom weaken our capacity for national defense. This is traditional with us and will continue so as long as we think only of the profits of victory and forget altogether the losses of a lost war. On this score, however, it is to be hoped that sanity will prevail and that in correcting mistakes we will not go so far as to defeat the existence of the things, the principles, *the victories* that have made us what we are.

And so we urge a just and fair approach to the problem of American munitions. The World War indicated many things of which the most vital was that we could mobilize and train our manpower at a much faster rate than we could our munitions power. The men behind the men behind the guns undertook their duty as best they knew how. They were urged to exert their every effort. They did. In any future emergency they will do so again with patriotic zeal. They have an idea of the losses of a lost war. They know that profit—to all and to the country as a whole—must be measured in relation to the losses of a lost war. They agree most heartily that "the preservation of the country must come first."

Association Affairs

Annual Directors Meeting

THE annual meeting of officers and directors of the Army Ordnance Association was held at the Union League Club in New York City on March 7, 1935. In the absence of the president, Brig. Gen. Benedict Crowell, who was detained in his home in Cleveland by a slight illness, Col. William W. Coleman, first vice-president, presided. Officers and directors in attendance were Brig. Gen. Samuel McRoberts, director; Brig. Gen. John Ross Delafield, counsel; Brig. Gen. Chas. Elliot Warren, treasurer; Colonels Frank A. Scott, Robert P. Lamont and James L. Walsh, directors; and Maj. L. A. Codd, executive secretary. In the editorial columns of this issue are published the resolutions adopted by the meeting upon the loss of three distinguished members of the Board who died during the preceding year: Col. William C. Sprnance, second vice-president; Mr. Ralph M. Dravo and Mr. Pliny E. Holt, directors. In tribute to the memory of Colonel Sprnance the office of second vice-president will remain vacant until the expiration of the term he would have served, December 31, 1936. In order that the directorate of the Association might be kept at its full complement, the vacancy caused by the death of Mr. Holt was filled by the unanimous election of Lieut. Col. LeRoy Hodges of Richmond, Va.

Considerable discussion was given to the reports of the treasurer and executive secretary which were submitted at the meeting. The financial position of the Association, despite an operating deficit for the year 1934, is satisfactory and the slight net loss in members shown by the secretary's report is a considerable improvement over recent years. Copies of these reports and of the annual audit by Messrs. Ernst and Ernst, certified public accountants, are available for all members. Generals Delafield and Warren and Major Codd were reappointed counsel, treasurer and executive secretary, respectively, for two years ending December 31, 1936.

The board discussed the general program of activities of the Association for the year 1935, suggested the appointment of a committee to consider awards of medals, suggested that the annual meeting of the Association at the Aberdeen Proving Ground be resumed during the coming fall, recommended the revival of a prize for award among students of the First Class of the United States Military Academy and again went on record as favoring educational orders for the peace-time production of ordnance. Colonel Scott extended an invitation to the board to hold its next annual meeting in Celeveland.

Colonel Hodges Elected Director

AT the annual meeting of the Board of Directors of the Army Ordnance Association on March 7, 1935, Lieut. Col. LeRoy Hodges of Richmond, Va., was unanimously elected to succeed the late Pliny E. Holt as a director of the Association. Colonel Hodges' term will be until December 31, 1938.

The Association is fortunate in having a man of Colonel Hodges ability and experience serve on its governing board. He has been active in Association affairs for many years and as chairman of the Association's Membership Committee has directed this phase of its activities with great success during the years of severe economic conditions. He is probably best known to the membership generally as the author of "Post War Ordnance," a volume published in 1925 which is acknowledged as an authentic text on the organization and functions of the Ordnance Department and the progress which had been made until that time in this country in post-war ordnance design. He is also the author of a series of articles under the title "Ordnance Notes" published regularly in the *Virginia Guardsman* and of the article "Appomattox" (page 290) in this issue of Army Ordnance.

Lieut. Col. LeRoy Hodges

But it is not in the field of authorship only that Colonel Hodges has attained a reputation of sound energetic leadership. He is an economist, a doctor of commercial science and a Phi Beta Kappa of Washington and Lee University. With the rank of lieutenant colonel of Ordnance he is and has been for several years State Ordnance Officer of the Virginia National Guard. He is a member and former president of the State Prison Board of Virginia, a former director of the budget of the Commonwealth of Virginia, holder of the Medal of Honor of the National Committee on Prisons and Prison Labor, and an Officer of the Order of the Crown of Italy and of the Order of the White Lion of Czechoslovakia.

In addition to his many public-spirited undertakings, he is and has been for some years State Director of the Virginia Chamber of Commerce and is acknowledged as one of the best informed on the commerce and industry of the Old Dominion State. Last year he established *The Commonwealth*, the artistic and informative monthly publication of the Virginia State Chamber.

So Army Ordnance welcomes one of its charter members to the Board of Directors and hails him as author, editor, economist, military student and ordnance devotee of the first rank. In addition, he is a delightful personality—a fact certain to be verified by all members who have not yet had the pleasure of his acquaintance.

Chicago Post

THE scepter of chiefship of the Chicago Ordnance District changed hands at a fitting ceremony held at the Chicago Club on March 12, 1935, when Mr. E. A. Russell relinquished the office and his successor, Mr. Frederick A. Preston assumed it. Gathered for the occasion was a distinguished company of military and industrial leaders to pay tribute to the retiring Chief and to extend felicitations to the new incumbent. In the editorial columns of this issue Army Ordnance has endeavored to express its high regard for the many years of faithful service rendered by Mr. Russell and its felicitations and welcome to Mr. Preston. The dinner was given under the auspices of the Chicago Post of the Army Ordnance Association whose president, Lieut. Col. A. K. Hamilton, Ord. Res., presided.

Among the distinguished guests present at the Chicago Club were Maj. Gen. William H. Tschappat, Chief of Ordnance, U. S. Army; Maj. Gen. Frank R. McCoy, Commanding the Sixth Corps Area; Brig. Gen. Dana T. Merrill, Commanding Fort Sheridan; Col. Frank Knox, publisher of the *Daily News;* Col. James G. Cowling, Regional Director of the NRA in Chicago who served with Mr. Russell during the war; N. Parker Holt of the Caterpillar Tractor Co., Peoria, Ill.; Robert E. Friend, president of the Nordberg Manufacturing Co., Milwaukee, Wis.; and W. L. O'Connell, president of the Illinois Auto Truck Company, Chicago.

General Tschappat presented Mr. Preston with his certificate

of appointment as District Chief and Mr. Preston responded in a short speech in which he expressed his appreciation of the honor and paid tribute to his predecessor. General Tschappat then presented Mr. Russell with a testimonial scroll on which were embossed the following sentiments:

"ORDNANCE DEPARTMENT OF THE UNITED STATES ARMY

Upon this, the occasion of his retirement from active service as Chief of the Chicago Ordnance District, we extend to

EDMUND A. RUSSELL

our profound thanks for his service to his fellow countrymen in war and in peace.

In the midst of the emergency of the World War, at an hour of supreme urgency, he assumed the responsibility of directing the industrial effort in an area of more than 2,000,000 square miles toward the speedy and efficient production of military armament for the defense forces of the United States. For this service he received the Distinguished Service Medal of his country. Later he guided the processes of industrial demobilization with fairness and understanding and due regard for the interests of the Government and the rights of individuals.

In September, 1922, he assumed the leadership of the Chicago Ordnance District and in the intervening years brought its function of industrial mobilization planning to a state of high efficiency.

Patriotic public servant, skilled in industrial management, leader of men, counselor and adviser in Government, his service during nearly a decade has been of untold value to the military establishment of his country.

In token of our esteem, congratulation and admiration, we have caused this acknowledgment to be prepared and presented to him with heartfelt thanks this 12th day of March, 1935."

IN response, Mr. Russell, whose service as District Chief began during the World War and continued without interruption during the past seventeen years, told of his high regard for the officers with whom he had served, his appreciation of their coöperation and his regret that he did not feel able to continue as Chief of the District. He assured General Tschappat and the Ordnance Department that in their selection of his successor industrial preparedness had enrolled a leader in every way worthy of the trust imposed in him.

Short addresses were also given by General McCoy and Colonel Knox, both of whom complimented the Ordnance District and its personnel upon the efficient manner in which one of the most important phases of preparedness is being conducted.

At the conclusion of the meeting the following members of the Chicago Post were elected officers: Mr. Russell, president; Maj. F. W. Parker, Jr., vice-president; Maj. M. K. Barroll, Jr., secretary; Maj. W. H. Damon, treasurer; and the following directors: Colonel Hamilton, Lieut. Col. W. R. Wright, Major Damon, Lieut. Col. Hugo Diemer, Mr. Preston, G. G. Thorp, Capt. W. B. Hobbs and Capt. C. A. Tibbals, Jr.

We take this opportunity to congratulate Colonel Hamilton, retiring president of the Post, for his unceasing interest in its work and his fine record of achievement. A cordial welcome is also extended to Colonel Diemer and Captain Tibbals who are new members of the directorate and our thanks to Mr. George E. Scott, Maj. F. A. Lorenz and Capt. C. E. Heimbrodt whose terms of office have expired. The Chicago Post, organized May 3, 1924, is now in its second decade. It looks energetically to the future for increasing opportunities of activity and service.

WASHINGTON POST

IN compliment to Maj. Gen. William H. Tschappat, the Washington Post held its first meeting of 1935 on March 20th at the Army and Navy Club when seventy members of the Post and their guests assembled for luncheon. Seated at the speakers' table with the honor guest were Hon. Harry Hines Woodring, the Assistant Secretary of War; Hon. P. H. Drewry, member of Congress and veteran member of the Naval Affairs Committee of the House of Representatives; Maj. Gen. Samuel Hof, former Chief of Ordnance; Brig. Gen. Herman W. Schull, Assistant to the Chief of Ordnance and Chief of the Manufacturing Service of the Department; Brig. Gen. Edward M. Shinkle, Assistant to the Chief of Ordnance and Chief of Field Service of the Department; Col. W. W. Gibson, retired, one of the elder Ordnance statesmen; Col. Harry B. Jordan, Commandant of the Army Industrial College; and Lieut. Col. LeRoy Hodges, Ordnance Officer of the Virginia National Guard and a newly elected national director of the Army Ordnance Association. Lieut. Col. Earl McFarland, president of the Washington Post, presided.

Preceding the address of the guest of honor, who was introduced by General Hof, brief remarks were made by Congressman Drewry and Colonel Hodges. General Tschappat took as the keynote of his address the soundness of War Department policy in depending upon private industry for the major portion of its ordnance requirements in war. He sketched the experience of the United States from its beginning as a nation through all its wars outlining the policies and practices which were necessary to secure ample supplies of military armament. He congratulated the members of the Post for their interest in industrial preparedness and characterized the Army Ordnance Association as the only organization of its kind devoted exclusively to the progress of emergency military needs. This, he indicated, was one of the several important outgrowths of our World War experience.

Colonel McFarland paid special tribute to Col. Rogers Birnie, now in his eighty-fourth year, who was to have been among the special guests. Colonel Birnie, who is rightfully regarded as a pioneer in the art of modern gun-making in the United States, retired from active service April, 1915. He was appointed to the Military Academy in 1868 and after his graduation was commissioned a second lieutenant of Infantry in 1872. He served with distinction through various grades until his retirement. Due to a slight indisposition Colonel Birnie was unable to attend the luncheon.

This meeting of the Washington Post was notable for other reasons as well: It was probably the largest attended in the history of the Post; it was marked by a spirit of good fellowship and joviality; from General Hof and Colonel Hodges it applauded two of the best after luncheon stories of the season, and it inaugurated what we hope will be the beginning of an Ordnance tradition—a toast "in the spirit (and spirits) of the Brick House Mess."

COLONEL MILLER TO ADDRESS MILWAUKEE POST

COL. HENRY W. MILLER, well known authority on the Paris long range gun and author of "Characteristics, Scope of Utility, etc., of Railway Artillery," will be the principal speaker at a meeting of the Milwaukee Post, Army Ordnance Association, to be held on May 7th. Colonel Miller is a member of the faculty of the University of Michigan and has contributed articles on his specialty to these pages. We urge all members of the Post to utilize this opportunity to hear an expert discuss one of the interesting developments of World War ordnance.

NEW MEMBERS

THE following have been admitted to membership in the Army Ordnance Association since the last issue of ARMY ORDNANCE: John P. Agan, Danville, Ill.; R. H. Anselm, Bartlesville, Okla.; Harry L. Appleton, Penlyn, Pa.; Thomas J. Boyd, Glenside, Pa.; William R. Carpenter, Akron, Ohio; James A. Chiles, University, Va.; Kenneth B. Conner, Philadelphia, Pa.; W. F. Costello, New Britain, Conn.; Lewis A. Dorgan, Toledo, Ohio; Daniel Dougherty, Philadelphia, Pa.; James B. Eliason, Wilmington, Del.; Donald C. Fabel, Cleveland Heights, Ohio; Ray J. Fitness,

Lansing, Mich.; Pehr Alfred Foren, Milwaukee, Wis.; Jesse Freeman, Wilmington, Del.; C. N. Galloway, Carthage, Mo.; Robert C. Graham, Detroit, Mich.; Gifford H. Hallock, Sauk Rapids, Minn.; Harry W. Hill, Southbridge, Mass.; R. J. Hollister, Bethlehem, Pa.; Frank Kahn, Philadelphia, Pa.; Robert H. Kampschulte, Paterson, N. J.; Howard G. Keene, West Medford, Mass.; Carl J. Kohler, Kohler, Wis.; Alvin Linden, Bryant, Wis.; F. Warren Marshall, Philadelphia, Pa.; George A. Marshall, Philadelphia, Pa.; Samuel A. McKone, Lawrence, Kans.; Arthur W. Mears, Dedham, Mass.; Willard W. Mize, Roseburg, Ore.; Ward W. Mohun, Lansing, Mich.; Raymond Montgomery, Salamanca, N. Y.; Lewis W. Powell, Philadelphia, Pa.; F. A. Preston, Chicago, Ill.; Eberhard M. Reiniger, Upper Darby, Pa.; C. R. Schubert, Bethlehem, Pa.; Walter R. Smith, Chicago, Ill.; William H. Smyth, Belgrade, Yugoslavia; Wayne Thomas, Lansing, Mich.; John M. Wells, Southbridge, Mass.; Ernest C. Wilson, Chester, Pa.; Robert G. Wolf, Philadelphia, Pa.; W. B. Woodring, Bethlehem, Pa., and Frederick R. Young, Cambridge, Mass.

Necrology

SINCE publication of the last issue of Army Ordnance notice has been received of the death of the following members of the Association: F. M. Bowman, Pittsburgh, Pa.; William Christensen, York, Pa.; Thomas G. Cranwell, Ventnor, N. J.; G. L. Evans, St. Louis, Mo.; H. S. Haynes, Kohler, Wis.; Herman A. Metz, New York, N. Y.; Richard E. Traiser, Brookline, Mass., and C. B. Woodworth, New York, N. Y. To relatives and friends of these deceased members Army Ordnance, for its readers, extends condolences.

Munitions Preparedness and the A.O.A.

MR. PHILIP H. GADSDEN, President of the Philadelphia Post, who was the toastmaster at the anniversary celebration of the Philadelphia Ordnance District—described more fully elsewhere in this issue—gave a splendid account of the Association's purpose in his brief address. We quote his remarks, in part, as an instance of his sound and forceful analysis:

"The keynote of this gathering is industrial preparedness. The term means the coöperation of Government and industry in planning for maximum effectiveness should the United States be so unfortunate as again to be compelled to defend itself by resort to arms. The whole philosophy is the outgrowth of our World War experience when we learned so thoroughly that the United States can mobilize its men at a far greater rate than it can its material resources and productive facilities. The weapons of warfare have little or no commercial use. In time of peace our industries are concerned with the production of peace-time necessities. In time of war they must change and make available, as speedily and efficiently as can be, their entire resources for the preservation of the nation in arms. To discuss so vital a subject is not to preach a war scare or to foment discord. All of us here are ardent in our desire for peace. We hope that the United States will never again be forced to resort to arms. Yet we are not so impractical that we shut our eyes to past experience and we believe with the founding fathers of our country that there is an obligation upon us all to be ready, willing and able to perform our respective parts in providing for the common defense. . . .

"The second point that I would like to emphasize relates to the problems which have been blazed in the headlines during recent months. I refer to what are called munitions makers. The Army Ordnance Association is not a group of actual munition makers. On the contrary it is an organization of several thousand executives and engineers of Amarican industry who are trying to keep familiar with the problems of ordnance production in time of peace in order that they may better serve their country should the emergency ever arise. The truth of the matter is, we have in this country no armament industry as such. When we consider all the bombast about munitions that has been served to our people and which can have no other purpose than to weaken their confidence and agitate their emotions along with so many other types of agitation which are rife in our country today we rightly begin to wonder whether there may not be abroad in the land forces at work which can be and are most harmful.

"We hold no brief for any abuses in any field of human relations. Mistakes were made during the World War simply because we did not know how to go about such a task in all its ramifications. There may be among us today an individual here and there in every form of industrial enterprise who will resort to unethical practices. But an abuse or a mistake in particular cases is never justification for a general indictment or for alleged remedial measures which are the denial of all our experience. We are told by some that the arms industry should be nationalized—an insidious proposal that could come only from wilful ignorance of the question. The Army Ordnance Association and its local posts stand for sane, fair and logical methods without inordinate profits for anyone and for maximum efficiency in time of trouble.

"Because we have no arms industry as such in this country the Association has sponsored for many years a plan of educational orders by which our peace-time producers of the tools of peace would be kept familiar and have an opportunity to actually try the production on a small scale and without inordinate profit of some of the complicated items of ordnance. We civilians often make the mistake of one of our late statesmen who quite foolishly made the claim during the last war that in our country a million men could spring to arms overnight. He very conveniently gave no thought to where the arms themselves might spring from. Modern arms are complicated, precise and elaborate things that only time and experience can bring to efficient production. One item of ordnance alone has as many as 20,000 individual parts. Students of the problem have said that if American industry had been educated along even such limited lines prior to the World War we could have saved countless lives of our fighting men, prevented a great waste of money and saved much priceless time. I challenge any sincere student of national defense to show that the policy of our organization is not sound in every detail."

Reprints of the following articles from this and recent issues of Army Ordnance are available for complimentary distribution:

"Facts About Munitions Makers"—A series of four 4-page editorials.

"American Munitions"—An address by Hon. George H. Dern, Secretary of War.

"The Production of Munitions"—A statement of War Department policy.

"Munition Makers and Common Sense"—An analysis by Hoffman Nickerson.

Members are invited to suggest the names of interested persons to whom copies of any or all of these articles will be forwarded without cost.

Ordnance Field Service

This is the first of a series of 12 articles—and possibly more, if interest warrants—by Major Marsh on subjects dealing particularly with the supply and maintenance functions, duties and responsibilities of the Ordnance Department of our Army. In our concern for the more general phases of Ordnance design and development sufficient emphasis is not always placed upon the importance of field service functions. This series will present a description of these functions and the responsibilities connected therewith. As a feature appearing regularly in these pages this department, we hope, will be of particular interest and value to Regular and Reserve Officers who are assigned to the Field Service of the Ordnance Department. Comments on the principles and policies described are invited at all times.—EDITOR.

ORGANIZATION AND OPERATION OF THE ORDNANCE DEPARTMENT

BY MAJOR RAYMOND MARSH, ORD. DEPT., U. S. ARMY

THE Ordnance Department is one of the supply services of the Army of the United States. Like the other supply services, its mission is "to carry out its assigned duties in such a manner as to increase the combat efficiency of the Army as a whole." And, like all the other supply arms and services, its measure of efficiency "is its capacity to function effectively in war in serving the combatant Arms" (TR. 10-5, par. 8-*c*). Expressed in another way, the sole task of a supply service and the sole reason for its existence is to supply the troops, in the quantities, at the times, and to the places needed, the articles for whose supply it is responsible.

The Ordnance Department is, in general terms, charged with "the provision and distribution, and maintenance and repair of certain prescribed articles, including generally all arms, armament, ammunition, tanks, special ordnance vehicles, bombs, and other equipment and supplies" for whose procurement, storage and issue the Department is made responsible. In accomplishing this mission, the Department acts in a dual function under two masters. It operates as a procurement agency under the supervision of the Assistant Secretary of War, and it functions as one of the services under the Chief of Staff.

All of the Department's activities under these two roles may be classified under two titles, namely, provision and distribution. Let us now see what the several activities under these classifications are, how the Department is organized to carry on these activities and what its facilities are.

First, let us consider a diagram of the general organization of the Ordnance Office of the War Department. It is organized, as you see, from Fig. 1, into a general office, a manufacturing service, a field service and a technical staff. The general office discharges all of those executive and administrative duties of the department which are common to all activities. The titles of the several divisions of the office are sufficiently explanatory of their duties. The Technical Staff renders technical advice to the Chief of Ordnance, conducts tests of experimental matériel, maintains technical liaison and distributes technical information. It is organized into an executive division and three other groups, based not

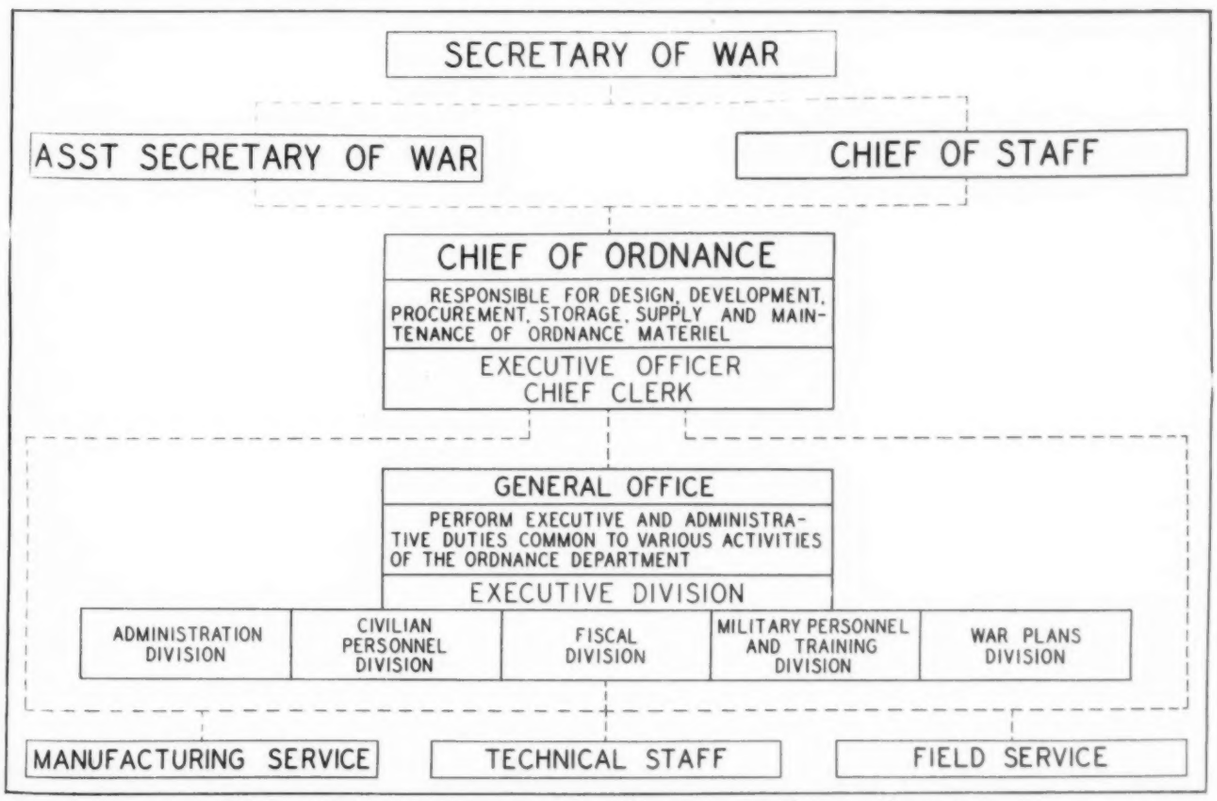


FIG. 1. GENERAL ORGANIZATION OF THE OFFICE OF THE CHIEF OF ORDNANCE.

on the functional theory of organization but rather on the commodity or divisional basis. These are, as indicated, the Ammunition, Artillery and Automotive, and Small Arms Divisions, each one of which handles matters within the jurisdiction of the Technical Staff, pertaining to the three major groupings of ordnance matériel as indicated by their titles.

The Manufacturing Service is one of the two operating groups of the Ordnance Office. Its functions are to design, develop, procure, produce, inspect and accept all ordnance matériel and to perform all duties incident thereto, not otherwise specifically assigned, including the administration of field establishments and facilities. It is organized into an executive division and three operating divisions, viz., the Ammunition, Artillery and Small Arms. The operating divisions are separated along commodity or divisional lines and each one handles all matters, within the jurisdiction of the Manufacturing Service, that pertain to the various classes of ordnance matériel as indicated by their titles. Automotive matériel, I may add, is handled by the Artillery Division. The Manufacturing Service is the only group to which procurement and manufacturing duties are assigned. It is the procuring agency of the Ordnance Department.

The Field Service is the other of the two operating groups of the Ordnance Office. This agency of the Ordnance Department was created in 1919 "for the supply and maintenance of such matériel as is, or may be, allowed to the Ordnance Department." Its functions are to store and issue ordnance matériel, to inspect, repair, alter and maintain ordnance matériel in the hands of troops and in storage and to administer the field establishments and facilities assigned to these duties. It is organized into an executive division and three operating divisions, namely, the Ammunition Supply, the General Supply, and the Maintenance Divisions. Here again we see an organization along commodity or divisional lines rather than functional lines. The Ammunition Supply Division, in general, is charged with all matters relating to the storage, issue and preservation—or renovation—of ammunition. The General Supply Division is charged with all matters relating to the storage and issue of all matériel, except ammunition. The Maintenance Division is charged with the supervision of the inspection, maintenance, repair of all matériel (except ammunition) in storage and in service.

IN this discussion of the organization of the Ordnance Department I have stressed the fact that the organization is not along functional lines but along divisional lines, with each division solely responsible for everything connected with the procurement or supply of some class or classes of articles or the performance of some particular Ordnance service. I have stressed this because of the fact that during the War the Ordnance Department was reorganized along functional lines, but after a few months of trial the functional system of organization was found to be unsatisfactory and was abandoned in favor of the prior existing divisional scheme, of which the present organization is just an elaboration and modernization.

Whenever any material, supplies or services are wanted or must be procured, it is necessary first to determine just exactly what kind of material, supplies or services are desired. In the Army, this determination of the type or kind of material, supplies or services is known as standardization. It constitutes the first phase of provisioning—the determination of what is wanted or required. The Army Regulations describe and define the different types of equipment required for use by the Army. The required types are divided into two major subdivisions, viz., adopted types and development types. In the adopted types, there are three further divisions: standard, substitute standard, and limited standard. In the development types, there are likewise three further divisions; namely, experimental types, service-test types, and limited procurement types.

We may now pass to a discussion of the several steps (Fig. 2) in the adoption of types of articles of equipment and items of

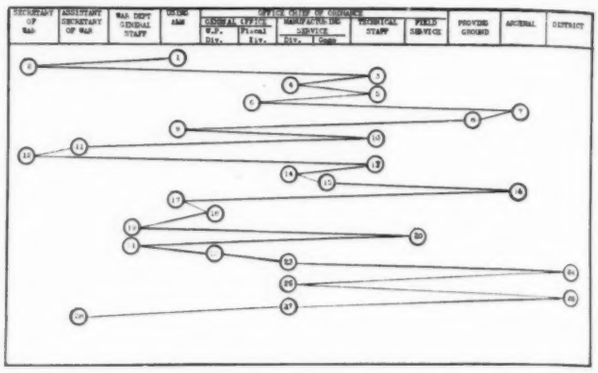


FIG. 2. PROCEDURE FOR ADOPTION OF STANDARD AND PROCUREMENT.

1. Requests new arm or equipment; 2. Approves requirement—Authorizes development; 3. Sets up development project; 4. Designs; 5. Approves design (through Ordnance Committee); 6. Sets up funds; 7. Manufactures pilot; 8. Tests pilot; 9. Tests pilot (if modification is required, pilot is returned to Ordnance and steps 4 to 9 inclusive are repeated to meet changes desired); 10. Recommends adoption as standard and essential (or not); 11. Approves for procurement; 12. Approves as standard and essential (or not); 13. Enters in Book of Standards; 14. Completes drawings and specifications; 15. Designs inspection gages, checks tolerances, etc.; 16. Prepares description of manufacture; 17. Indicates basis of issue desired; 18. a. Incorporates allowances in war-planning equipment chart; b. Determines wastage factors; 19. Approves wastage factors; 20. Determines accessories and spare parts to maintain main items; 21. Issues troop basis; 22. Computes military and procurement requirements; 23. Tentatively apportions to districts; 24. Estimates production from available facilities; 25. a. Prepares accepted schedules for districts; b. Reports estimates of production to W. P. Div., General Office; 26. Prepares factory plans; 27. Prepares specific procurement plan; 28. Approves specific procurement plan.

supply following the procedure as practiced in the Ordnance Department. When an arm or service feels the need of a new or improved piece of matériel, a request for such an item is submitted to the Secretary of War, the request setting forth the military need of the item and indicating the tactical features and military characteristics it should possess. If a General Staff study of the situation shows the merits of the request, the Secretary of War approves the requirement and authorizes the development of the item. Following the assumption that this is an ordnance item, this approved request and authorized development is forwarded to the Office of the Chief of Ordnance where, in the Technical Staff, a development project is set up. The designs are then prepared in the appropriate division of the Manufacturing Service. The designs next pass to the Ordnance Committee of the Technical Staff, a committee composed of representatives of the Navy and of all the arms and services of the Army, and civilian designers and technical specialists of the Ordnance Department. Here, the designs are carefully scrutinized, inconsistencies between tactical requirements, engineering capabilities and manufacturing limitations pointed out and compromises effected that are satisfactory to the using arm or service.

With the design, modified as may have been necessary, thus approved, the next step is the setting up of funds for the manufacture of the pilot, that is, a working model of the prescribed materials and characteristics. It very frequently happens that of the funds appropriated (for the Ordnance Department) for experiment, research and development, there will be funds which may be applied to this construction. In that case, the funds are set up by the Fiscal Division of the General Office of the Office of the Chief of Ordnance. In case there are no funds available, then the time-consuming method (Fig. 3) of estimates, budgetary hearings, congressional hearings, congressional action, etc., leading up to legislative appropriation, must be followed before any further work can be done. This latter procedure seldom can be accomplished under a year and a half. When funds actually become available, the actual manufacturing is done under the

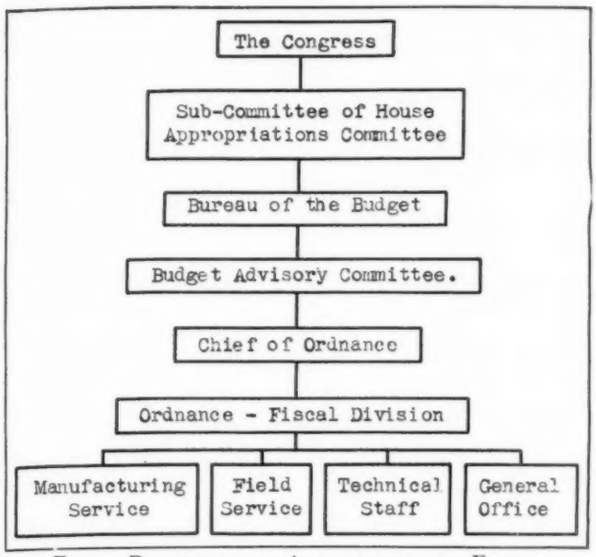


FIG. 3. PROCEDURE FOR APPROPRIATION OF FUNDS.

supervision of the Manufacturing Service in the appropriate manufacturing arsenal or, perhaps, by a commercial firm under contract.

THE pilot is first tested by the Government at the Ordnance Department's proving ground at Aberdeen, Maryland, to determine its technical suitability after which it is submitted to the using arm or service for a service test by a board of the arm or service concerned, or by troops. If during these tests deficiencies develop or modification becomes necessary, all the steps from the design through the test are repeated until a model is produced which is technically suitable and meets tactical requirements. When the using arm or service indicates its satisfaction with the pilot, the Technical Staff recommends the adoption of the item as one of the several required types. The design and such specifications as may have been prepared are then submitted to the Office of the Assistant Secretary of War for approval for procurement. This involves a thorough investigation from the viewpoint of procurement and is the first point at which the Ordnance Department in its role as a procurement agency comes under the scrutiny and supervision of the Office of the Assistant Secretary of War. Is it manufacturable commercially in the quantities desired and at the times wanted?—is the question here to be answered. This is the first point of contact between military requirements and the standards of industry with respect to materials, quality, methods and processes and any conflicts which are detected are here harmonized.

When an item has been cleared for procurement, all the papers in the case are submitted to the Secretary of War, who usually follows the recommendations and approves the item as one of the several required types, and indicates whether it is or is not an essential item. If it be approved as one of the standard items, the Technical Staff enters the item in the Ordnance Department "Book of Standards." The Manufacturing Service completes the drawings and specifications, designs the necessary manufacturing inspection gages, checks the drawings for tolerances and undertakes the ultimate preparation of a description of manufacture. The item may then be procured to meet current needs, issued in accordance with an approved rearmament and reequipment program, procured in accordance with some specific legislative mandate, or laid aside to be procured and issued only when quantities on hand of a prior standard become exhausted.

THE nature of the item to be procured having thus been determined, the next step is to determine the quantities to be procured, or the quantities required. In time of peace this is usually answered in terms of funds available, and the Army obtains not what it wants or needs, but as much as the limitation of funds will permit. In war planning, however, the procedure is entirely different and the total requirements may be calculated.

The foundation on which the Ordnance Department bases its requirements for war planning is the troop basis, which is a part of the mobilization plan for every particular war plan, and also one of the essential features of the general mobilization plan. This troop basis lists the organizations to be mobilized, indicates their type, shows the date of their mobilization and also the date at which they leave the Zone of Interior for the Theater of Operations. Applying to this list of troop organizations, the tables of basic allowances, etc., it is possible, although voluminous, to determine the exact amount of equipment required to complete the initial equipment of the troops involved. To this must be added the requirements for such reserves as may have been indicated will be established throughout the echelons of supply. Additions must also be made for the supplies required for any special defense project, such as harbor defenses, etc. The requirements under these three headings might be termed basic requirements. To them certain other factors must be applied in order to arrive at the proper total of requirements. First we must add the maintenance factor, which includes all of those items, spare parts, etc., which are required to maintain the initial equipment in a complete and serviceable condition. Then a distribution factor must be added. This factor is introduced in order to make provision for the quantities of supplies which will be absorbed in the supply system, such as, for example, the numbers required to cover additional varieties, stocks in transit, and depot stocks. Another very important element which must be considered is the time it takes for items to progress from the manufacturing plant to the organization to which they are to be issued. This is called the time lag, and for war planning purposes, it has been assumed to be 30 days in the Zone of Interior, and 60 days in the Theater of Operations. As a result of the application of this time lag, our requirements for the Zone of Interior demands must be advanced in planning 30 days, and similarly, an advance of 60 days must be made in the requirements for Theater of Operation units. Another factor which must be considered is the consumption factor, particularly of ammunition. From this it is apparent that the calculation of requirements does not end with the determination of the total quantities required on M day. The final calculation of requirements covers a period of time and indicates the monthly rate of supply which must be maintained if the organizations are to be properly equipped and supplied with such items as are consumed or otherwise expended.

Having determined the total requirements, our requirements are known in both items and quantities. The next step is the the procurement of such of those quantities as are not already on hand. The procurement system employed by the Ordnance Department in time of peace is wholly different from that which it is contemplated will be put into effect in time of war. This difference in peace-time procedure and war-time methods is due to a number of reasons. It is perhaps unfortunate, but there are arguments on both sides of the question. Peace time procurement is performed through the agencies of the Manufacturing Service in the Office of the Chief of Ordnance. You will recall from our recital of the functions of the Manufacturing Service that it is the only group in the organization of the Office of the Chief of Ordnance to which procurement and production duties are assigned. The major procurement tasks imposed upon the Manufacturing Service are based on requisitions submitted by the Field Service for the quantities of supplies needed by the Field Service to permit it to meet the demands on it for such supplies. The Field Service and the Technical Staff both perform some few minor procurement functions incident to the accomplishment of their respective missions.

(To be continued in the May-June issue of this Journal.)

Professional Notes

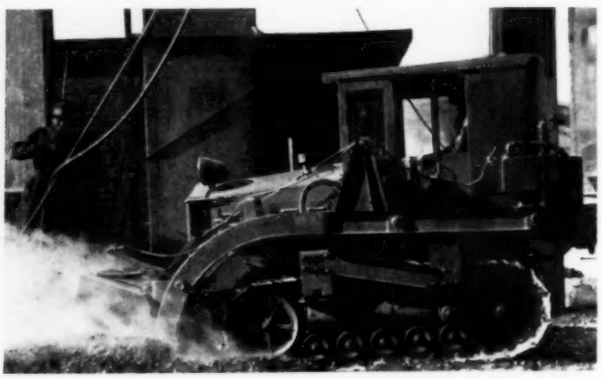
Plant Vehicles

By Capt. T. R. Taber, Frankford Arsenal

"*PROVIDED that, effective January 1, 1935, no appropriation contained in this Act shall be available for any expense of any character, other than as may be incident to salvage or scrapping on account of any motor propelled vehicle procured prior to January 1, 1920, except tractors, ambulances, fire trucks and vehicles now in use by Reserve Officers Training Units. . . .*" Thus reads the scripture.

The now well known provision of the 1935 Army Appropriation Act has been at once a boon and a scourge to motor transportation officers of Ordnance establishments. Not one would not be glad to see the last of the war-time vehicles still in service, but the announcement of the quoted provision was accompanied by a laconic statement that the normal procurement agency for wheeled vehicles would be unable to make replacements within at least six months after legislated abandonment of the old vehicles.

The same Act, however, with its supporting regulations, left one loophole for busy Ordnance establishments. The purchase of plant vehicles from Ordnance funds is authorized as in recent previous years.



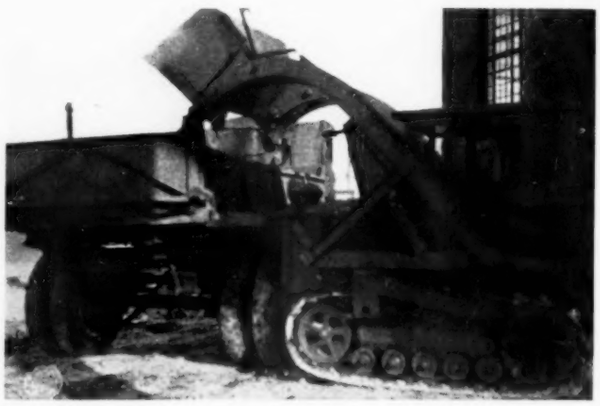
Crawler with Front-end Loader.

Procurement principles dictate that standard Quartermaster types will be used for plant purposes whenever adaptable. However, this requirement, at times when lack of standards or funds makes the savings incident to mass procurement impossible, may constitute a disadvantage to individual establishments.

THE motor equipment for an active Ordnance establishment, excepting passenger vehicles, is engaged in service department hauling and kindred duties, and in inter-departmental, urban and inter-arsenal hauling. Let us examine the motor vehicle field for types to fill these requirements.

Tractors of wheeled and crawler types occupy a prominent place among service vehicles. Wheeled tractors are less wasteful of power, and are therefore economical of fuel, but comparatively low traction makes them and their accessories useful only for the lighter tractive, grading, sweeping and ploughing jobs. Lately developed pneumatic tires for these vehicles make them adaptable for use on both paved areas and soft ground, and bid fair to supplant the spade lugs ordinarily associated with such tractors. Many useful accessories are available for certain models of wheeled tractors only, and the accessory market must be borne in mind in stating tractor requirements.

Some service duties can only be performed successfully with crawler tractors, with or without accessory tools. The old 5-ton tractors may be continued in service under the law for tractive duties, but may be advantageously supplemented by more modern types with accessory tools. One such vehicle may well be used equally as tractor, winch, hoist, bulldozer, grader, back filler, snow plow, and loader for truck or gondola; all at about one-half the cost of the old 5-ton tractor bare. Anywhere in the United States snow belt it is advisable to procure crawlers with snow tracks of open, self-cleaning construction, and appropriate street plates, and mud and ice grousers. In some cases rubber tracks are desirable, as they give the maximum traction on dry smooth pavements.



Loader in Raised Position.

The crawler crane, first cousin of the tractor, need only be mentioned here if considered as a tractor with large accessories which "sits down to its work."

The dump truck continues to be a busy vehicle in service activities, what with cinders, rubbish and building materials to be handled cheaply and quickly. Of course, the maximum usefulness of this restless vehicle can only be realized if loading is speeded up to its ability to unload in short order. Chutes or ground loading devices are indicated accessories.

There is some choice possible in bodies for dump trucks, though centralized procurement may result in arrival of an elegant sand body for the primary purpose of hauling rubbish at 100 pounds to the yard. It is believed a standardized high-and-wide body, with removable upper section for concentrated loads, will be the ultimate answer to this problem. Another body believed not yet accepted is the handy scow-backed "garbage" body without tail gate. For wet loads it receives this writer's vote.

For machinery transfers a variety of needs exists, ranging from a light open pick-up truck, through heavier platform-stake trucks and crane-and-winch trucks to crawler tractors. The latter are sometimes best used with a skid plate, which is merely a piece of half-inch boiler plate rolled up slightly at one end, and sometimes backed with thin steel runners. This simple device obviates hoisting at either end of the haul. Heavier machinery will necessarily be moved on rolls or heavy duty low trailers.

INDUSTRIAL hauling within the reservation consists of scheduled or unscheduled pick-ups, scheduled and unscheduled heavy hauling. Pick-up trucks, as the name implies, should be light and fleet. These vehicles may not all be of the smallest type, but every establishment can use one or two vehicles of minimum capacity at a distinct saving. The single rear tires furnished ordinarily only with this type increase its value where frequent stops are made against curbs, and such stops are usually often.

Intermediate tonnages in the industrial area are best moved by trailers. Small 4-wheel trailers may be coupled into tractor-drawn trains, but the larger sized 4-wheel trailers are quite definitely made obsolete by development of the semi-trailer. Both small and large 4-wheel trailers will give best results if steering is by 5th wheel. Trailer operation, if sufficient trailers are available, can be used to practically eliminate idle time for motor

INDUSTRIAL 3-WHEEL TRACTOR WITH TRAILER TRAIN.

vehicles, loading and unloading being done while the motive power is engaged elsewhere.

In the case of the larger trailers, 4-wheel types are troublesome due to bad traction unless the tractor vehicle is wastefully ballasted or usefully loaded with resultant delay at destination. Trailing characteristics are very poor at all but crawling speeds, especially with knuckle steering, and backing is very difficult. Two-man hooking up and hazards on down grades are other reasons for unpopularity.

The semitrailer outlook, on the other hand, is very promising. Semitrailers are purchaseable at reasonable cost, but normally come with vacuum brakes, which are not required in ordinary plant use, and have retractable front braces which are time consuming unless automatic in operation (at a price). A very satisfactory semitrailer can be made at a cost of less than $100.00 by using parts of a salvaged 3- or 5-ton 4-wheel trailer, as shown by accompanying photographs. Each salvaged 4-wheel trailer will make two semi-trailers, or one semi-trailer plus some spare parts. It is possible to make the front brace solid for most plant use, depending upon the tractor lift to clear the brace while in motion, and incidentally cheapening and simplifying home construction. The standard kingpins are procurable from trailer manufacturers.

Two types of tractor have been found useful for moving the small 4-wheel trailers and large semitrailers. The smaller of these will weigh from 3,000 to 5,000 lbs. Turning radius should be very short to permit use in buildings and freight cars; this condition is best met by 3-wheel construction. However, the 3-wheel tractor is less stable in slippery going and on inclines, and its small turning radius is closely approached in modern 4-wheel industrial tractors. Pneumatic tires fill most requirements better than solids, and large diameter driving wheels are essential to satisfactory service in bad weather. Pneumatic tires permit satisfactory use of skid chains. A push plate is a handy accessory for this vehicle.

For semitrailers a commercial truck-tractor with fifth wheel is required. The height of the semitrailers available must be borne in mind in ordering the tractor, and the level height of the fifth wheel of the latter should be a few inches higher, with load applied, than the under-body height of the trailer over its axle. Spring deflection under load should be kept to a minimum for plant use. Several fifth wheel systems are in successful commercial use, and it goes without saying that the same system must be used for all mating vehicles at one plant. High speed is not necessary or desirable in a truck-tractor for plant use, so that the power plant may be modest, but the rear axle and springs must support approximately 45 per cent of the trailer load and should be specified accordingly. A high rear-end ratio will give best results in hooking up loaded semitrailers, and is consistent with the low top speed required. The number of truck-tractors required is dependent upon length of hauls and number of semitrailers available. In an industrial area of approximately 75 acres it is found that one tractor can handle not less than 20 semitrailers. This gives an idea of the savings in motor vehicles and operating costs possible under this system.

Intermediate-tonnage trucks are required in limited numbers, even if trailers are used largely to supplant them. For this use the Army express bodies with bows and canvas covers are not ideal in Ordnance plants. It is believed that platform-stake bodies with roll-back canvas covers will be found more convenient, especially when side loading is desired. In very bad weather the panel-body trucks needed for urban and inter-arsenal trips are useful within the reservation. Heavy trucks of the same types may be required occasionally in the industrial area, but their extensive use for this purpose cannot be justified.

ALL Ordnance establishments are located near towns, and many are in or near metropolitan districts to which frequent trips must be made. Pick-up trucks with canopy-top express and panel bodies, medium and heavy trucks with stake or panel bodies, and panel bodied semitrailers can all be used to advantage for this class of hauling.

In these days of platform-to-platform railroad service and cheap, reliable contract trucking, there are still cogent reasons for inter-arsenal trucking, scheduled or unscheduled. Here alone heavy, high speed transportation comes into its own, and modern panel bodies are the logical choice, with permanent tops or roll-back tops according to predominent cargoes. Trucks and semi-

TRUCK-TRACTOR AND LOADED SEMI-TRAILER.

trailers are used for this service, with the trend towards semi-trailers.

Heavy trucks are appearing in increasing numbers with engines partly or entirely under the cabs, which is the manufacturer's answer to the demand for high cargo carrying ability with moderate wheelbase. This type of vehicle is costly, however, and the driver's original prejudice against it is only partly removed by improved steering and brakes, as his riding comfort is involved due to his position over the axle.

Passenger vehicles of types used in the field are normally furnished to meet requirements of Ordnance establishments. These include conventional cars of light, medium and heavy types, and eight and twelve passenger station wagons, the latter sometimes being called reconnaissance cars. The twelve passenger vehicle is intended to perform the necessary bus service, though not ideal for this use. The eight and twelve passenger vehicles are both procurable as plant vehicles with glass sides in lieu of the standard side curtains.

ORDNANCE officers who have been engaged wholly or partly with motor transportation during the past year have doubtless all had experiences similar to the author's, but a few important lessons learned are put down for what they may be worth.

Truck manufacturers have practically abandoned the net tonnage ratings formerly associated with trucks. They offer vehicles on various chassis to carry a specified gross load at a prescribed speed on hard level road, to climb a specified grade in high gear

with this gross load and with prescribed rear-end ratio and tire equipment. The governing factors, aside from chassis strength, are obviously engine torque, rear-end ratio and tire size. The manufacturer, by choosing advantageous figures for the governing factors can therefore guarantee—and demonstrate—surprising load-carrying ability with moderate power plants on smooth roads. This is his normal problem.

However, the normal problem of persons choosing military transportation for field use is to imagine the worst possible condition of roads, or lack of them, and provide for the same. Therefore, vehicles for use where field conditions rarely if ever exist, when requisitioned through Washington under manufacturers' load recommendations, will be much heavier and more expensive than expected, but will be fitted with a permanent plate limiting the load to a fraction of that recommended by the manufacturer for other industrial or commercial service. While the loads indicated by dash plates may not be exceeded, the increasing need for light, fleet vehicles makes it advisable to scale tonnage capacity downward rather than up to makers' recommendations in preparing requisitions.

Vehicles of types procured for other branches are normally equipped for field service, which probably includes items which add to cost but are detrimental to plant use. If specifications are available prior to requisitioning, equipment may be scaled down by exceptions to the specifications in individual cases.

Delays in procurement are avoidable where the cause is departure from types offered as commercial standards by the maker, but are unavoidable in cases when the award is made on models not previously tested and bought by the Government. Anticipated tire equipment should be based on Army standards rather than on truck or tire manufacturers' recommendations, as not all sizes and types are available. Balloon tires are normally furnished and sizes usually available are very liberal.

So to restate the case:

Present laws wisely permit the purchase of plant vehicles from Ordnance appropriations, and real savings to the Government are possible with proper industrial type transportation. While the choice of equipment is somewhat restricted by the existence of standards considered suitable for plant use, it is believed that a real effort is being made to have available all special types showing marked superiority over the standards usually furnished for field service, and intelligent statement of requirements cannot fail to improve conditions.

Whitworths and Other Guns at Gettysburg

By Richard D. Steuart

THERE was a curious little story tucked away in a corner of the newspaper the other day. It was a dispatch from Gettysburg and it told how an attempt had been made to carry off one of the "*Wentworth*" cannon used in the battle from its position on Oak Ridge. The theft was balked when the gun carriage broke, according to the dispatch, but the thieves carried off 20 projectiles from an iron base on which they were bolted.

There are four Whitworth rifled cannon on the battlefield of Gettysburg, but two of them are reproductions—fakes. It is interesting to note that the thieves had sufficient discrimination to try to steal one of the real ones.

The pair of genuine Whitworths are on Barlow's Knoll, in the position which they occupied in the early part of the battle as part of the armament of Hurt's Alabama Battery. On the third day, during the bombardment which preceded Pickett's charge, Hurt's Battery was stationed near the Fairfield Road. And this position is marked by the two bogus Whitworths.

The real Whitworths are marked on the trunions: "Whitworth Ordnance Co. Patent 1861 Manchester" and the serial. One is No. 37; the other No. 44.

The Army of Northern Virginia had four of these three-inch breech-loading rifles in 1863 and they were the finest guns in both armies. They had a range of five miles. In fact, during the Chancellorsville campaign one of these guns, just furnished to the Army, shelled a Federal wagon train near Aquia Creek, more than three miles away, with considerable effect. At first the British-made projectiles were used, but the Confederates began to make Whitworth shot and shell at Richmond in May, 1863, and the product was successful.

In his fine work, "The Long Arm of Lee," in which he tells the story of the artillery of the Army of Northern Virginia, Jennings C. Wise says Lee had at Gettysburg four *six-inch* Whitworth rifles. This must be a slip of the pen. The largest fieldpiece used at Gettysburg was the 24-pounder howitzer with a bore of 5.7 inches.

Wise says one of these six-inch Whitworths was attached to the Washington Artillery of New Orleans. William M. Owen, adjutant of the Washington Artillery, who wrote a careful history of that famous command, makes no mention of this six-inch gun, but does mention a three-inch rifle, which is what the Whitworths used at Gettysburg were. Nor can I find in any other book or record a reference to a six-inch Whitworth rifle in the Confederate army.

Gettysburg is one of the most interesting battlefields in the world to the student of military history. But it is also a perfect artillery museum of the Civil War. There can be found every type of field ordnance used in the War. And in many instances, as in the case of the Whitworths, the guns there are the very ones used in the engagement.

It also tells a chapter of the history of the Confederate Ordnance Department, for there are shown three-inch rifles made at Tredegar Iron Works, Richmond, and bronze Napoleons and howitzers from Macon, Augusta, Selma and other Confederate cannon foundries.

Next to the Whitworths the most interesting guns on the field are a pair of 24-pounder bronze howitzers which are relics of the Battle of Solferino, June 24, 1859, as well as of the American Civil War. Having done good work for the Austrians in their battle against the Franco-Sardinian forces, four of these bronze guns were sold to the South and run through the blockade in December, 1861.

The two on the battlefield of Gettysburg were used by the Madison Light Artillery and are marked as having been made in Vienna, one in 1858 and the other in 1859.

A New Commercial Explosive

"NITRAMON" is the name given to a new commercial explosive announced at the Eighteenth Annual Technical Section Convention of the Explosives Department of the duPont Company in January. The new blasting material, for use in quarries and other blasting operations such as coal stripping, has unusual qualities. It is stated that Nitramon cannot be detonated by the strongest commercial blasting cap, by impact, by flame nor by shooting a rifle bullet into it. In actual use it is exploded by means of a large diameter cartridge of dynamite. Sealed up tightly in a tin can, it is rendered absolutely water resistant.

This new development has been covered by two patents, one for the product itself and the other for the method of use. It represents a very radical departure in the explosives field. It is non-freezing and non-headache producing. The inability to detonate the material by any ordinary means increases safety in transportation. Adapted solely for use in large diameters, the new product will be marketed only in 4, 4½, 5 and 7-inch sizes being designed specifically to fill as nearly as possible the qualifications for use in quarries and in coal stripping operations.

Blank ammunition containing a reduced charge (6 ozs.) of sodium nitrate black powder has been developed by the Ordnance Department for the 3-inch wrought-iron saluting gun and 3-inch field gun, to eliminate objections to the noise produced by the standard 1-lb. charge.

Book Reviews

ARMS AND MUNITIONS. Compiled and edited by Joseph H. Baccus. New York: Noble and Noble. 1935. $2.00.

THIS is Volume I of the Pi Kappa Delta series of the University Debater's Help Book. Egbert Ray Nichols is general editor of the series. Mr. Baccus, who compiled and edited this volume, is connected with the Department of Speech, University of Redlands, Redlands, Calif. The handbook has as its purpose to help the debater and reader cover the field of arms and munitions thoroughly. The subject "Resolved that the nations should agree to prevent international shipments of arms and munitions" has been selected for debate in the larger forensic societies during 1935.

We regret that our impression of this volume, despite the apparent attempted fairness of the editors, is not nearly as enthusiastic as we should like it to be. The process of selection of the material thus placed in the hands of our university debaters is decidedly inadequate. Of the quoted references the vast majority is of a nature which is not particularly concerned with the national defense of the United States. This impression finds expression in the advice of the editor of the volume when he makes such statements as these: "In the United States, however, the activities of the munitions makers became the subject of Congressional investigation and the disclosures were heard reverberating around the world," and again, "What the future holds for these investigations and for trade in arms and munitions no one knows. Predictions are that munition lobbies will kill all action, and the public does forget."

The editor gets off on the wrong foot entirely even in the definition of terms in the question for debate. He defines munitions as "materials actively and purposefully used for the destruction of life and property." We challenge this definition before any competent jury in the land.

Nine pages are given to general arguments for the positive side, *i.e.*, that international shipments should be prevented, seven for the negative. The allotment is not disproportionate although the remainder of the text is decidedly of a positive nature. The editor says, "The negative debater may feel that there is little definite material on his side of the question." This, of course, is not factual. There is material running back for generations and centuries. And it is material of much greater worth than many of the high-sounding partial and actually sensational writings of a positive nature to which a great deal of space is devoted.

It is in connection with such a volume as this that attention must again be called to the nature of the important question discussed and the competency of those who have apparently not made a thorough study of it to guide public opinion and university debaters. The presentation of arguments pro and con might well have been assigned to specialists in this important field, the debater to take or leave whatever in them has logical foundation and practical value. But when, as in this book, quotations are presented the student under the title, "What modern leaders in world affairs say about arms and munitions" and these quotations include many sensationalists who are not especially qualified to speak, we doubt that "Arms and Munitions" will meet the requirements of its important purpose. For this we do not blame the general editor or Mr. Baccus or the publishers. Many of our best minds have been led astray by the barrage of agitation—a campaign in which few of the hustings distinguish between statements of people who know what they are talking about and

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those who do not. There is a vast difference between the factual approach of the qualified student of the problem on the one hand and the individuals and organizations who seek peace by ballyhoo and mud-slinging on the other. The bibliography of books, magazines, pamphlets and biographical sources will not be of much help to the debater unless he is able to answer the question in each case, "Does the author know what he is talking about?" Alas for American education—we are not an educated people because we are not a thinking people. If we were, we would not let our imaginations run away with ourselves. This reviewer is not so sure that college debaters will develop their analytical faculties with this well-meant but, in many ways, quite silly presentation. O. E. D.

Leaders and Leadership. By Emory S. Bogardus. New York: D. Appleton-Century Co., Inc. 1934. $3.00.

Heredity, external social stimuli, and personality traits are the forces which are examined by Dr. Bogardus in this attempt to establish theories and principles of leadership. His method is to scrutinize samples from the acknowledged leaders of the past and present in order to reach a conclusion concerning the relative importance of the influences at work. Some may be born leaders but the influence of heredity is not of paramount consequence. The occasional importance of external social stimuli justifies the contention that, in a sense, some leaders have greatness thrust upon them. On the other hand the essential influence of personality traits suggests that the fault is not in our stars but in ourselves if we fail to achieve leadership. The discussion of the parts energy, intelligence, character and other traits play in reaching a position of leadership in contact with other human beings is illustrated by many examples.

Dr. Bogardus considers leadership as a social phenomenon, as "personality in action under group conditions." Since the capable army officer long since abandoned both the autocratic basis of leadership and exclusive dependence on an act of Congress or on War Department regulations for his authority over his followers, a study of leadership as defined above must prove useful. Although the author deals almost exclusively with leadership in civil affairs, the thoughtful regular or reserve officer will nevertheless find in this book many stimulating principles on which to meditate. D. A.

A History of the Great War. 1914-1918. By C. R. M. F. Cruttwell. New York: Oxford University Press. 1934. $5.50.

Innumerable statesmen in the belligerent countries of the World War have published voluminous evidence of their own infallibility and have described in considerable detail the low grade mentality of their military and naval colleagues. The soldiers and sailors have been equally prompt in showing how their deft and faultless strategy was brought to naught by the inept interference of ignorant politicasters. Out of the welter of all these memoirs and diaries, out of the chaos of official documents, opinions of experts and polemics of one sort or another, some one was destined to bring order. The distinction of performing the Herculean feat of compressing into a well ordered narrative of a little more than six hundred pages an unbiased and objective account of the military, naval, diplomatic and political events from August, 1914, to November 11, 1918, belongs to Mr. Cruttwell, sometime soldier of the King and now Principal of Hertford College, Oxford. With the perspective of a trained historian the author achieves a degree of restraint and detachment that can judge friend and foe with equal fairness. He has no preconceived theories of war to uphold and he makes no unjustified generalizations. It is evident that much careful research has preceded the writing of this book which will delight the reader with its smoothly flowing narrative.

The author has met with great success in his avowed purpose

"to keep a just proportion between the military, diplomatic, and political aspects, as also between the different theaters of war, and to prevent the reader from being lost in a mass of detail." The American reader, however, may feel that the description of the activities of the A. E. F. is overcompressed, and that the few pages devoted to the American forces in France are inadequate compared with the magnitude and influence of our effort. On the other hand there can be no quarrel with his estimate of our Army and its leaders. Unquestionably no other book yet published combines so effectively a naval and military history of these years with a shrewd and dispassionate estimate of character, both of the leaders of the armed forces and of statesmen. Certain parts of the book, such as the development of the Russian revolution and the disruption of Jutland, are particularly noteworthy. D. A.

FIELD ARTILLERY, THE KING OF BATTLES. By H. G. Bishop, Major General, U. S. Army, Chief of Field Artillery, 1929-1934. Boston: Houghton Mifflin Co. 1935. $2.00.

FIELD artillery officers have been required at all times to have a fairly thorough knowledge of Ordnance design, but there has been no reciprocity in the matter of Ordnance Officers understanding the use of the matériel that they design and manufacture. It would doubtless be advantageous for every Ordnance officer to have some acquaintance with the problems and the kinds of activities of the Field Artillery. The difficulty of obtaining such knowledge in the past by delving into the vast mass of training literature of the artillery has been effectively removed by the publication of this book by the late Chief of Field Artillery. General Bishop has covered the organization of the field artillery, the methods of using the matériel developed for it by the Ordnance Department, the problems of the preparation and conduct of fire, and the tactics of the arm. The book is written in non-technical language and offers no difficulties in gaining a clear comprehension of the professional secrets of the artilleryman. D. A.

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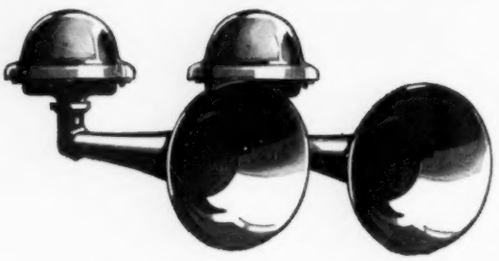

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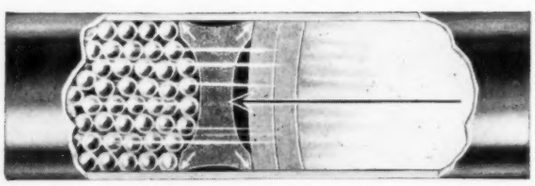

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